AD-A037 079 MITRE CORP MCLEAN VA F/G 1/5

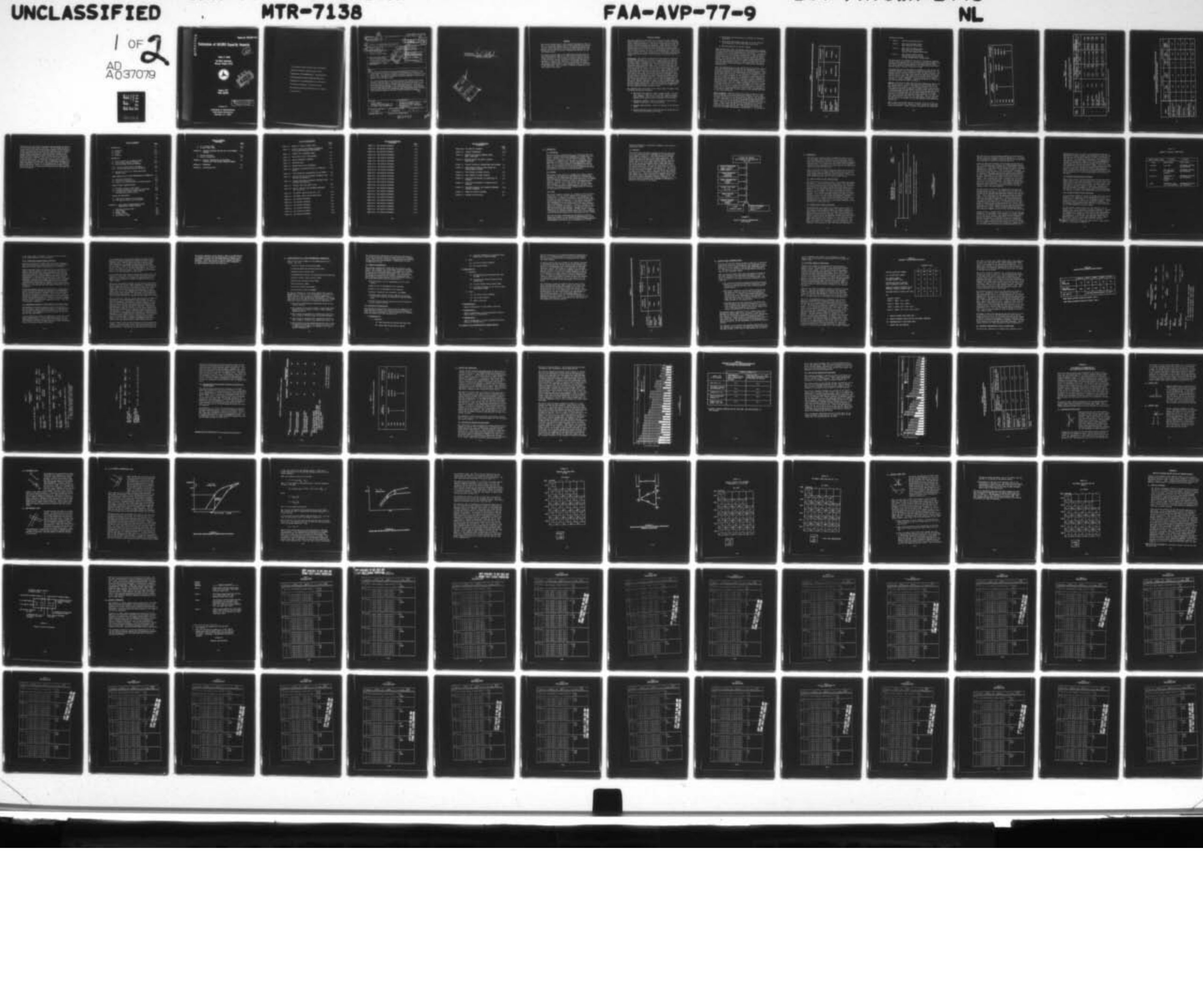
ESTIMATION OF UG3RD CAPACITY IMPACTS.(U)

JAN 77 A P SMITH DOT-FA70WA-2448

UNCLASSIFIED MTR-7138 FAA-AVP-77-9 NL

1 OF 2

AD A037079



10

Report No. FAA-AVP-77-9

Estimation of UG3RD Capacity Impacts

12

Arthur P. Smith

The Mitre Coporation
McLean, Virginia 22101

January 1977
FINAL REPORT

Prepared for:

DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration
Washington, D.C. 20591

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
(18) FAA-AVP (19) 77-9 ✓		(12) 109p.

4. Title and Subtitle	5. Report Date
(6) Estimation of UG3RD Capacity Impacts	(11) January 1977
	6. Performing Organization Code: 188A
7. Author(s): (10) Arthur P. Smith	8. Performing Organization Report No.: (14) MTR-7138
9. Performing Organization Name and Address: Mitre Corporation, McLean, Virginia 22101	10. Work Unit No. (TRAIS)
	11. Contract or Grant No.: (15) DOT-FA70WA-2448
12. Sponsoring Agency Name and Address: Office of Aviation Policy, Federal Aviation Administration, 800 Independence Ave., S.W., Washington, D.C. 20591	13. Type of Report and Period Covered: (9) FINAL REPORT
	14. Sponsoring Agency Code

15. Supplementary Notes

16. Abstract

This study provides airport runway capacity estimates for the top 30 U.S. air carrier airports for the FAA's Upgraded Third Generation ATC System Cost Benefit Study. The capacity estimates were made at five year intervals for both IFR and VFR conditions for the baseline and the five alternative configurations defined for the cost benefit study.

The results indicate that if the UG3RD Generation ATC system is fully implemented by 1990 and if wake vortex conditions are favorable then nearly a 40% increase in capacity could be realized at the top 30 air carrier airports under IFR conditions and an increase of 23% under VFR conditions. The greatest increase in IFR capacity (48%) accrues to those airports which use a dual-lane runway configuration as their predominant mode of operations in IFR conditions. This increase in capacity is expected to reduce terminal area delays.

17. Key Words	18. Distribution Statement
Runway Capacity Upgraded Third Generation ATC Air Traffic Control Investment	Document is available to the U.S. public through the National Technical Information Service, Springfield, Virginia 22161

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	85	

Form DOT F 1700.7 (8-72) Reproduction of completed page authorized

402364 1B

MITRE Department
and Project Approval: Fred Holland
Frederick C. Holland

ABSTRACT

This study provides airport runway capacity estimates for the top 30 U. S. air carrier airports for the FAA's Upgraded Third Generation ATC System Cost Benefit Study. The capacity estimates were made at 5 year intervals for both IFR and VFR conditions for the baseline and the six alternative configurations defined for the cost benefit study.

The results indicate that if the UG3RD Generation ATC system is fully implemented by 1990 and if wake vortex conditions are favorable then nearly a 40% increase in capacity could be realized at the top 30 air carrier airports under IFR conditions and an increase of 23% under VFR conditions. The greatest increase in IFR capacity (48%) accrues to those airports which use a dual-lane runway configuration as their predominant mode of operations in IFR conditions. This increase in capacity is expected to reduce terminal area delays.

EXECUTIVE SUMMARY

The basic objective of this work was to support the FAA's Upgraded Third (UG3RD) Generation ATC System Cost Benefit Study by providing airport capacity estimates to the Office of Aviation Policy and the Office of Systems Engineering Management. These capacity estimates together with future demand estimates would then be used to derive expected delays in the terminal areas of National Airspace System. These results appear in the report on delay estimation (Reference 16) and the report covering the entire study (Reference 15). The reductions in delays due to the implementation of the UG3RD Generation ATC System would be one measure of the benefits to be derived from the UG3RD.

Methodology: The capacity estimates which were made for this study are capacity estimates of the runways of the airports in question. Terminal airspace, taxiway, gate, and landside capacities were not considered here. The methodology which was used in this study was the single runway throughput type. Basically this means that the nominal spacing between all combinations of pairs of arriving aircraft was determined based on the performance characteristics of the aircraft and the air traffic control rules. Then a weighted average of the nominal spacings was made assuming a random mix of pairs of arriving aircraft. From this average nominal spacing between aircraft pairs, the average operational rate could be deduced. Allowance was made in this model for speed differentials between the arriving aircraft, spacing uncertainties, runway occupancy times and the various ATC separation rules. In some cases adjustments were made to the nominal interarrival times to allow for departures. Additionally, multiple dependently operated runways were modeled using the basic single runway model. This was achieved by the appropriate choice of model parameters to reflect the interaction between the aircraft operating on the different runways.

The parameters that are needed in the single runway throughput capacity model include the following:

- The arrival and departure runway occupancy times. For arrivals, this is a function of the aircraft class and runway exit placement. The aircraft class, for capacity purposes, depends on the approach speed and weight of the aircraft.
- Separation standards. This is a function of the aircraft classes of each pair of arriving aircraft.
- Approach speed profiles. This is a function of the aircraft class.
- Required spacing between a departure and the following arrival for IFR arrival/departure runways.

- The metering and spacing error in delivery to the glide slope gate.

- The minimum time between departures of various aircraft class necessary to reflect the wake vortex rules.

- The percentage mix of aircraft classes.

UG3RD Alternatives: This cost benefit study considered a baseline case and five alternative configurations reflecting various degrees of implementation of the UG3RD Generation ATC System. It turns out that there is no differentiation between some of these alternative configurations as far as capacity estimation is concerned (Since capacity and delay are only part of the total system cost benefit study). By correlating the required capacity model parameters with the UG3RD E&D products and the cost benefit configurations one derives the matrix shown in Table 1. This matrix shows the airport capacity-related differences between the baseline and alternative configurations.

Since the configurations are also defined by the particular sites at which the UG3RD Generation System will be implemented, it is also necessary to address how this impacts the capacity estimates. Since the ultimate measure of the effectiveness of the performance of the runway system will be delay, it is sufficient to consider only the top 30 air carrier airports for the purposes of estimating capacity. For each of these 30 airports it is necessary to make assumptions about the future development of the airport as well as modeling the operational usage of the runways. The basic assumptions which were made here were 1) that new runways and approach aids would not be considered unless there is a current commitment to construct runways or install such aids, 2) only the long runways were to be modeled since the aircraft mix included only aircraft used by scheduled carriers, and 3) where possible and a choice exists, the segregation of arrivals and departures would be made to allow maximum efficiency in the runway operations.

<u>Model Parameters</u>: Work has recently been done to develop a common set of predicted longitudinal separation standards and other technological parameters to be used in studies related to the assessment of future performance of the elements of the FAA E&D program (Reference 5). There were four groups of UG3RD E&D products identified which reflect the increasing capabilities of the UG3RD Generation ATC System. These groups are based on the implementation of various levels of wake vortex systems, metering and spacing systems, and final approach monitoring systems. These groups can be directly related to the UG3RD Configurations through Table 1. The groups are

TABLE 1
CAPACITY-RELATED E&D PRODUCTS IMPLEMENTED IN THE UG3RD GENERATION CONFIGURATIONS

	CONFIGURATION		
E&D PRODUCT	BASELINE CONFIGURATION	CONFIGURATION 1	CONFIGURATIONS 2, 3, 4, AND 5
METERING AND SPACING	MANUAL	BASIC	ADVANCED
WAKE VORTEX SYSTEMS	NONE	ADVISORY	AVOIDANCE
FINAL APPROACH MONITORING	ATCRBS	IMPROVED ATCRBS	DABS

defined as follows:

Group 1	Wake Vortex Advisory System
Group 2	Wake Vortex Advisory System Basic Metering and Spacing
Group 3	Wake Vortex Avoidance System Basic Metering and Spacing Improved Final Approach Monitoring
Group 4	Wake Vortex Avoidance System Advanced Metering and Spacing Discrete Address Beacon System (DABS)

The dates which are estimated by the FAA for the possible implementation of these groups leads to information contained in Table 2 for the purpose of equating the capacity estimates of the E&D groups with the alternative configurations of the UG3RD Generation ATC System Cost Benefit Study as a function of time.

The parameters used for the capacity estimates for both IFR and VFR conditions depend on how effective the Wake Vortex Systems are. If, because of meteorological conditions, there are wake vortices in the approach path to the runway, then additional separation between the aircraft must be used. The specification of this additional separation (or "fall back" separation) is also required in the capacity estimation. The group dependent separation standards (for both arrivals and departures) are shown in Table 3.

Results: The airport runway capacities were computed for the top 30 air carrier airports at five year intervals for the UG3RD E&D product groups shown in Table 2. The general conclusion that can be made from the estimates of capacity increases is that airports with a predominant dual-lane (dependent parallel) runway structure having a large percentage of heavy aircraft will accrue the greatest benefits from the implementation of the UG3RD Generation ATC System. It can also be concluded that greater capacity benefits will result under IFR conditions than under VFR conditions. Thus, the IFR capacity, being initially lower than the VFR capacity, should approach the VFR capacity as elements of the UG3RD Generation ATC System are implemented.

Table 4 shows the average capacity increases of the top 30 air carrier airports grouped as a function of their respective predominant runway configuration. These increases are based on the capacities

TABLE 2
UG3RD GENERATION CONFIGURATIONS VS ATC GROUPS

YEAR	BASELINE CONFIGURATION	CONFIGURATION 1	CONFIGURATIONS 2, 3, 4, AND 5
1975	BASELINE	BASELINE	BASELINE
1980		BASELINE	BASELINE
1985		GROUP 2	GROUP 3
1990			GROUP 4
1995			
2000			

TABLE 3
UG3RD RUNWAY CAPACITY PARAMETERS

- ARRIVAL/ARRIVAL MINIMUM SEPARATION STANDARDS
- DEPARTURE/DEPARTURE SEPARATION RULE

UG3RD GROUPS	EQUIPMENT COMPLEMENT	IMPLEMENTATION DATE AT FIRST SITE	MIN. SEPARATION STANDARDS		DEPARTURE DEPARTURE RULE *
			IFR	VFR	
			• WVAS REDUCED • FALL BACK (%USE) (NMI)	• WVAS REDUCED • FALL BACK (% USE) (NMI)	• WVAS REDUCED • FALL BACK (% USE) (SEC)
BASELINE	TODAY	75	– 3/4/5 (100%)	– 1.9/2.7/3.6 (100%)	– 60/90/120 (100%)
1	WVAS (ADVISORY)	79-82	3/3/4 (40%) 3/4/5 (60%)	– 1.9/2.7/3.6 (100%)	60/60/90 (40%) 60/90/120 (60%)
2	WVAS (ADVISORY) BASIC M&S	80-85	3/3/4 (40%) 3/4/5 (60%)	– 1.9/2.7/3.6 (100%)	60/60/90 (40%) 60/90/120 (60%)
3	WVAS (AVOIDANCE) BASIC M&S IMPROVED MONITORING	82-88	2.5/2.6/3.5(75%) 3/3/4 (25%)	1.9/2.3/3.2 (75%) 1.9/2.7/3.6 (25%)	60/60/60 (75%) 60/60/90 (25%)
4	IMP. WVAS (AVOIDANCE) ADVANCED M&S DABS	84-90	2.0/2.3/3.0(75%) 3/3/4 (25%)	1.9/2.1/2.7 (75%) 1.9/2.7/3.6 (25%)	60/60/60 (75%) 60/60/90 (25%)

*GROUPED ACCORDING TO LIGHT-ANYTHING/HEAVY-HEAVY/HEAVY-LIGHT.

TABLE 4
AVERAGE CAPACITY INCREASES WITH IMPLEMENTATION OF UG3RD GENERATION ATC SYSTEM AT TOP 30 AIR CARRIER AIRPORTS

RUNWAY CONFIGURATION	VFR CONDITIONS			IFR CONDITIONS		
	NUMBER OF AIRPORTS	FULL UG3RD (CONFIG 2-5)	LIMITED UG3RD (CONFIG 1)	NUMBER OF AIRPORTS	FULL UG3RD (CONFIG 2-5)	LIMITED UG3RD (CONFIG 1)
DUAL LANE OR DEPENDENT PARALLELS	7	28%	11%	17	48%	17%
INDEPENDENT ARRIVALS/DEPARTURES	7	27%	12%	4	36%	12%
INTERSECTING	9	22%	8%	4	27%	11%
SINGLE RUNWAY INDEPENDENT PARALLELS	7	15%	6%	5	18%	9%
OVERALL AVERAGE	30	23%	9%	30	39%	14%

estimated in the year 2000 and assuming reduced separations permitted by favorable wake vortex conditions. The full UG3RD Configurations, based on the Wake Vortex Avoidance System, provide estimated capacity increases of 10% to 40% in VFR conditions with an average of 23%, and 15% to 60% in IFR conditions with an average of 39%. Limited UG3RD Configurations, based on the Wake Vortex Advisory System, provide estimated capacity increases of 5% to 15% in VFR conditions with an average of 9%, and 5% to 20% in IFR conditions with an average of 14%. A significant factor is that currently 17 of the top 30 airports use a dual-lane or dependent parallel mode of operations under IFR conditions. This is the runway configuration which is benefited the most by the implementation of the UG3RD Generation ATC System. Thus, it is expected that the delays at these airports should show a significant decrease with the resulting benefits to the system.

TABLE OF CONTENTS

TABLE OF CONTENTS
(CONCLUDED)

LIST OF ILLUSTRATIONS

LIST OF ILLUSTRATIONS
(CONTINUED)

LIST OF ILLUSTRATIONS
(CONCLUDED)

1. INTRODUCTION

1.1 Background

The FAA's Office of Aviation Policy, in conjunction with the Office of Systems Engineering Management, is conducting a cost benefit analysis of the UG3RD Generation ATC System. That analysis is in response to Action Item II, Milestone 3 of the Department of Transportation, "Review of the Upgraded Third Generation Air Traffic Control System Developments," August 1974. One of the tasks assigned to The MITRE Corporation in support of that analysis was to provide estimates of the airport capacity of the various UG3RD system configurations being considered in the overall cost benefit analysis.

1.2 Purpose

The purpose of this paper is to document the airport capacity estimates for the alternative implementation configurations considered in the UG3RD Generation system cost benefit analyses. These estimates were made for the thirty busiest U.S. air carrier airports. Besides providing an input to the passenger delay reduction analysis part of the system cost benefit study, these estimates of airport capacity can also provide insight as to the expected capacity improvements at individual airports and for predominant runway configurations as a function of UG3RD Generation alternatives.

1.3 Scope

The airport capacity estimates are estimates of the peak operations rate of the air carrier runways at the airports under consideration. A general discussion of the methodology used to arrive at these estimates is given in Section 2 with a more detailed discussion in Appendix A. The various UG3RD Generation implementation alternatives are discussed in Section 3. The correspondence of the alternatives to the model parameters values are discussed in Section 4. Section 5 provides a summary of the capacity improvements to be expected from the various UG3RD Generation alternatives. Appendix B contains the complete set of capacity estimates for each airport. Appendix C discusses the estimated capacity gains that could be associated with additional airports with close-spaced parallel runways.

This work has been coordinated with the Office of Aviation Policy with respect to the alternative implementations of the UG3RD Generation System and with the Office of Systems Engineering Management with respect to an acceptable set of future

separation standards, technological parameters, and system implementation dates.

1.4 Approach

The process which was used to estimate the airport capacities at the top thirty airports is depicted in the informational flow diagram in Figure 1-1. The UG3RD Generation configurations drive the estimation of the airport capacities. The methodology which was used is that being employed for other studies applicable to the UG3RD Generation system, namely an update study to the FAA's Eight Airport Study (Reference 9). The future separation standards based on UG3RD E&D products were estimated by OSEM. The aircraft fleet mixes for each of the thirty airports for the years of interest were provided by the FAA Office of Aviation Policy (Reference 17). Each of the airports was modeled by MITRE. This information was combined to produce the airport capacity estimates of the same airports (see Appendix B). These other estimates included those of the FAA's Eight Airport Study (Reference 9), MITRE's Airport Surface Traffic Control Deployment Analysis (Reference 11), and the FAA's Engineered Performance Standards (Reference 12). The resulting capacity estimates were forwarded to AVP/OSEM for analysis of the delays in the system.

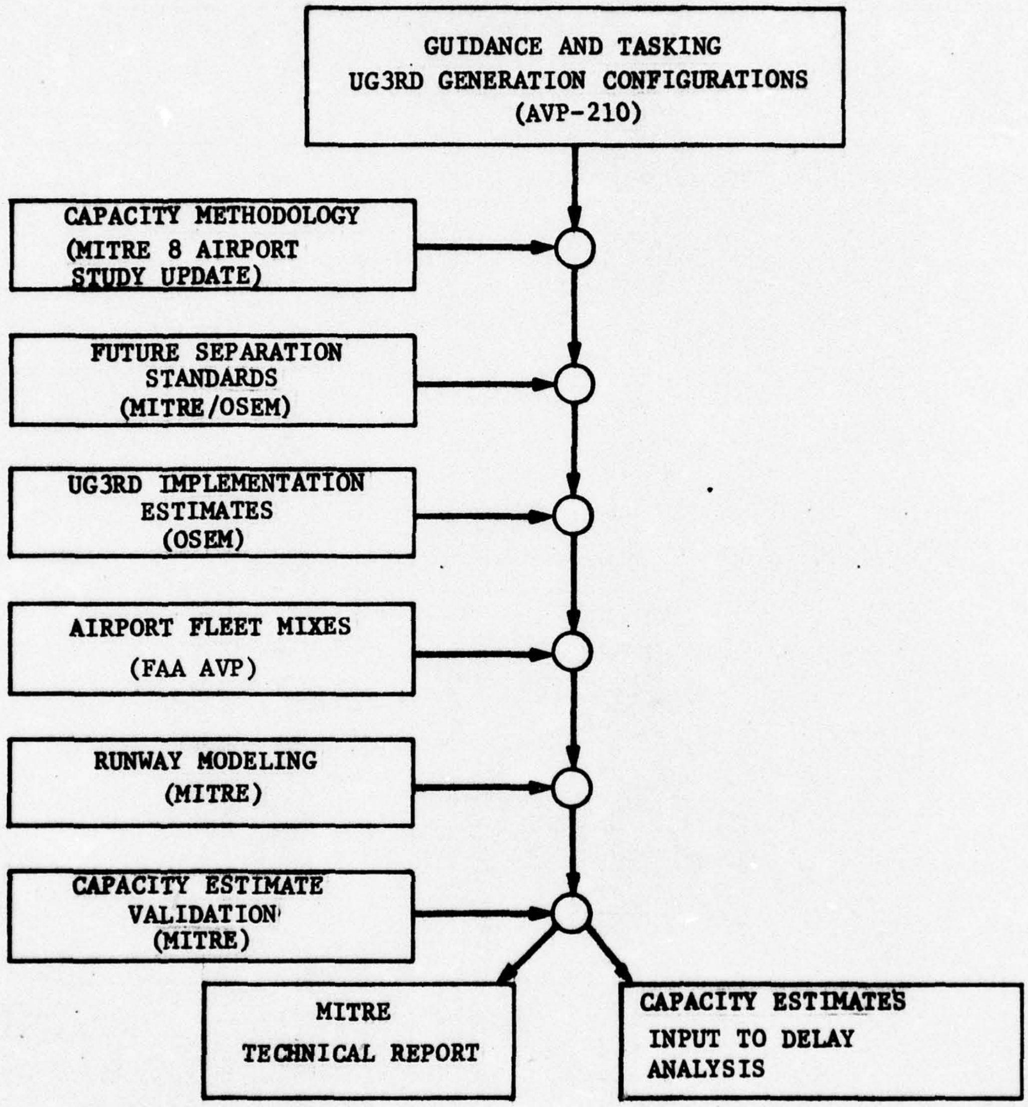


FIGURE 1-1

CAPACITY ESTIMATION INFORMATIONAL
FLOW DIAGRAM

2. METHODOLOGY

The model which has been used to estimate the runway capacity at the airports under consideration is basically that used in previous MITRE analyses of runway capacity (Reference 1 and 2). This type of model is referred to as a single runway throughput capacity model. The recent draft edition of the FAA handbook for airfield capacity (Reference 3) is also based on the same type, albeit more sophisticated, model.

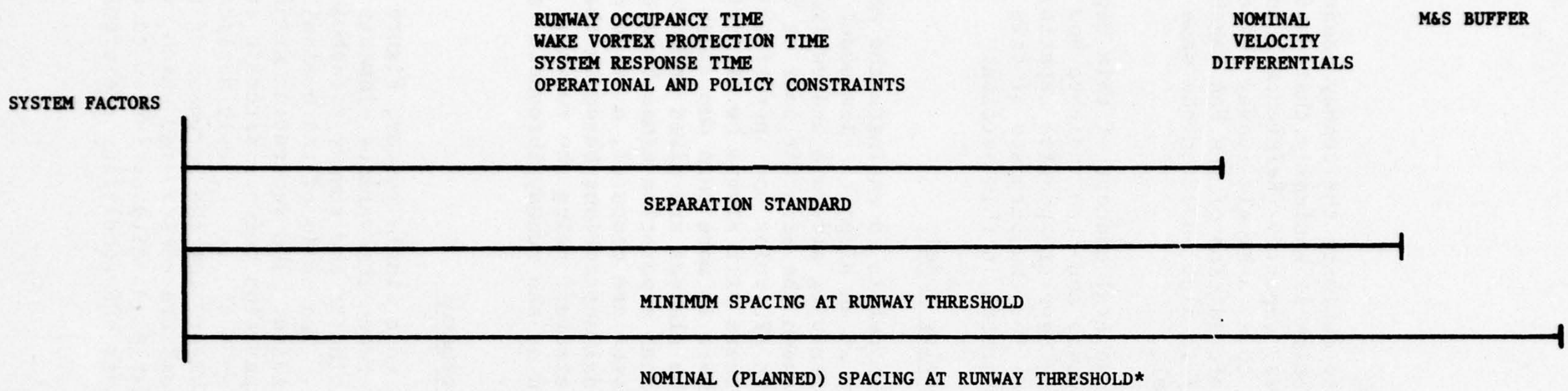
This section will describe the general concept of this capacity model as applied to a single runway and then indicate how multiple runway cases are handled. Several specific capacity related assumptions have been made for the purposes of this study. These assumptions will also be stated in this section.

2.1 Basic Concepts of the Capacity Model

The objective of this capacity model is to estimate the maximum throughput of the runway system at an airport. The model does this by considering a pair of arriving aircraft and estimating the nominal time separation between the aircraft pair at the runway threshold consistent with ATC rules and operational constraints. It is assumed that there will always be aircraft ready to land or depart. If there is more than one class of aircraft, it is assumed that the classes are mixed in a random sequence. Thus, after the nominal separation times between all possible pairs of aircraft classes are computed, a weighted average is taken of these nominal separations based on the random mixture of the classes of aircraft using the runway. This average nominal time separation at the runway threshold is then converted to a operations rate.

2.2 Single Runway Capacity Estimates

If one considers only arrivals to a single runway, Figure 2-1 illustrates the relationship between the various elements of the system and the nominal spacing at the runway threshold between a given pair of aircraft. The basis of the nominal separation is the separation standard. The separation standard, which is interpreted as the separation between aircraft at which control action is taken (Reference 4), is strictly applicable under IFR conditions only. However, for the purposes of the model, VFR "separation standards" are constructed which, when used in the model, give reasonable capacity estimates to the operation rates experienced under VFR conditions (Reference 5).



- MIX DETERMINES WEIGHTING OF ABOVE VALUES OVER POSSIBLE LEAD-TRAIL COMBINATIONS TO ARRIVE AT CAPACITY

* ACTUAL SEPARATION MAY BE LARGER DUE TO SPECIFIC CONDITIONS (E.G., DEPARTURE INTERLEAVING)

FIGURE 2-1
RELATIONSHIPS BETWEEN SYSTEM FACTORS AND ARRIVAL-ARRIVAL SPACING

The rationale for the relationship between the system factors and the separation standard is given in Reference 4. The values for the separation standards for future ATC systems are estimated in Reference 5 and will be listed in Section 4.

Since the separation standard is the minimum spacing which is not to be violated, the controller will add separation between the aircraft of different classes due to their nominal velocity differential. This will yield the minimum spacing at the runway threshold (see Figure 2-1). There is also a control system which delivers the aircraft to the outer marker. Presently this is a manual system using vectoring and speed control commands. In the future, automated metering and spacing procedures will be used. Regardless of the control system used, there will be inaccuracies in the delivery time of the aircraft to the outer marker. Thus an additional buffer is added by the controller to account for these inaccuracies. The resulting spacing between the two arriving aircraft is the nominal or planned spacing at the runway threshold. It is this nominal spacing, as described above, that is averaged over the mix of aircraft classes to give the runway capacity.

The discussion to this point has assumed that the runway has arrival operations only. If the runway were to be used only for departures, the capacity model would consider only two constraints on the nominal spacing between a given pair of departures. These constraints are the departure runway occupancy time of the leading departure and the required separation between the given pair of departures. The required separation in a radar environment (which is assumed at all the airports considered in this study) is set as a minimum value with additional separation if the leading departure is a "heavy" (Reference 6). The maximum separation due to these two constraints is considered to be the nominal spacing between departures on a departures only runway. This procedure for making departure only capacity estimates is used for both IFR and VFR conditions.

At many airports, a single runway is used for both arrivals and departures. An estimation of the capacity of a runway operated in this mode is as follows. The nominal spacing between arrivals at the runway threshold (see Figure 2-1) is in general modified (increased) to accommodate a departure between each pair of arrivals. The arrival-arrival rules are satisfied because the nominal spacing between arrivals can only be increased. The amount of increase in this spacing will depend not only on the nominal departure-departure spacing discussed for the

departures-only case, but also on the required spacing due to the departure runway occupancy time (applicable to both IFR and VFR) and the IFR rule which requires at least 2 nmi between a departure and the subsequent arrival at the time of the departure release. The model takes the maximum of the minimum arrival-arrival spacing (see Figure 2-1), the departure-departure spacing, and the departure-arrival spacing, and then adds to this spacing the metering and spacing buffer. This is the nominal interarrival spacing modified to interleave departures which is used to calculate the arrival/departure runway capacity. There are additional complexities in the arrival/departure capacity estimation process that are discussed in Reference 2 but are not necessary for a basic understanding of the concepts of the model.

2.3 Multiple Runway Capacity Estimates

Most of the large air carrier airports have and use more than a single runway. The runway configurations at the top thirty airports can be grouped into three types - the single runway, parallel runways, and intersecting runways. In most cases it was sufficient to consider runways in pairs only. Exceptions to this are discussed in Appendix A. The following discussion describes how the basic single runway model is used to estimate the capacity of parallel and intersecting runway configurations.

2.3.1 Parallel Runway Capacity Estimates

If two parallel runways are spaced far enough apart, they can be operated as two independent single runways with a capacity of twice that of a single runway. If the runways are more closely spaced, they have to be operated in a dependent fashion. In IFR conditions parallel runways spaced greater than 4300 feet can be considered independent* whereas 700 feet is the minimum spacing for VFR independent parallel runways.

For IFR parallel runways spaced less than 4300 feet, the dependent nature of the operations is shown in Table 2-1. In this category, the airports studied had spacings from 3000 to 3400 feet between major runways. In this case, a dual-lane operation as described in the MITRE report on the dual-lane runway concept (Reference 7) is modeled. The dual-lane runway model is essentially the single runway model modified to have a minimal arrival runway occupancy time before the departure

*The impact of reduction in independent IFR parallel runway spacing to 3000 feet is discussed in Appendix C.

TABLE 2-1

SUMMARY OF PARALLEL RUNWAY RULES

RUNWAY SPACING (FEET)	IFR MODEL	VFR MODEL
0-699	SINGLE RUNWAY	SINGLE RUNWAY
700-2499	DUAL LANE	INDEPENDENT ARRIVALS AND DEPARTURES
2500-3499	DUAL LANE WITH NO INTERRUNWAY VORTICES	INDEPENDENT ARRIVALS AND DEPARTURES
3500-4299	INDEPENDENT DE-PARTURE DEPENDENT AR-RIVALS	INDEPENDENT ARRIVALS AND DEPARTURES
4300+	INDEPENDENT ARRI-VALS AND DEPARTURES	INDEPENDENT ARRIVALS AND DEPARTURES

on the other runway is released. All other rules that apply to the single runway are still applicable.

2.3.2 Intersecting Runway Capacity Estimates

Intersecting runways are modeled like a dual-lane configuration: the arrivals land on one runway while departures are released on the other runway between each pair of arrivals.

After the arrival crosses the intersection the departure is released. When the departure clears the intersection, the appropriate departure/arrival spacing determines when the next arrival can cross the runway threshold. In IFR the 2 nmi departure/arrival rule is applied when the departure is at the intersection. In VFR the next arrival has to be beyond the threshold as the departure crosses the intersection. In either visibility condition, the standard arrival/arrival and departure/departure spacings must be observed. Therefore, in the model the arrival and departure runway occupancy times are proportionate to the distance from the runway threshold to the intersection.

If the intersection point is such that both the arrival and departure are airborne through the intersection, an additional rule is required because of possible wake vortex interactions. This rule is interpreted as follows. After a "heavy" flies through the intersection a minimum time separation is enforced before the succeeding arrival or departure on the other runway can fly through the intersection. At only one airport (O'Hare) was this type of intersection a significant factor. This case is discussed in Appendix A.

2.4 Assumptions Specific to UG3RD System Cost Benefits Study

The estimation of airport capacity at particular airports for the cost benefit study requires knowledge or assumptions about how the airport operates, the future facilities, and the mix of aircraft. The assumptions that have been made at each airport are discussed below.

At each airport the capacity is estimated for either one or two runway configurations. If two runway configurations are commonly used at an airport and the capacity estimates for them are different, then both estimates are made as being representative of the capacity range at the airport.

It is assumed that new high speed runway exits would be constructed as needed to minimize the impact of arrival runway occupancy time. However, there still may be ground traffic flow constraints. An example of this may be the placement of the terminal building such that departures have to cross arrival runways to get to the departure runways. In this case the arrival runway is not strictly independent of the operations on the departure runway. These situations are accounted for in the detailed modeling at each airport.

As a general rule only the major runways at an airport are considered for this study. This is because during the peak hour operating conditions at the busiest air carrier airports the traffic will be composed of scheduled flights which use the longer runways.

The airport improvements assumed for this study are those which can be identified to have a high probability of implementation. This includes installation of ILS facilities as part of the ILS program (Reference 13) and construction of new runways where commitments for such construction have been made. In most cases, there are no firm commitments for new runways although the National Airport System Plan lists many of the airports as desiring such improvements. In such cases it was assumed that no new runways would be built during the time frame of the study.

The installation of ILS's at closely spaced parallel runways for simultaneous IFR approaches beyond those currently in place was not considered. The reason for this is that the four airports of the 30 studied whose major parallel runways are less than 4300 feet apart and could benefit from simultaneous IFR approaches have a maximum spacing of 3400 feet. Simultaneous IFR approaches cannot be justified to such closely spaced runways without the addition of a specific parallel approach monitor (Reference 14). Although compatible with the UG3RD Generation ATC System, the monitor can conceivably be implemented independently of the UG3RD Generation E&D program. The availability of DABS would facilitate such a monitor but the monitor would not require DABS. Appendix C discusses the capacity gains at the four airports which could benefit from a reduction in the close spaced parallel runway minimum spacing.

At many airports there can be a choice as to how to operate the runways. With the current rules it may be that departures can be interleaved with arrivals on a runway with little effect on the arrival rate. This may not be the case in the future when

the arrival separation can be reduced. Thus it is advantageous to segregate arrivals and departures wherever possible to reap the greatest benefits from the UG3RD Generation System implementation. Thus, where there are several runways available at an airport and no contradicting reason is known, segregation is applied between arrivals and departures.

3. UG3RD GENERATION ATC SYSTEM IMPLEMENTATION ALTERNATIVES

There are nine major elements of the UG3RD Generation ATC System. They are:

- Discrete Address Beacon System (DABS)
- Airborne Separation Assurance System (ASA)
- Flight Service Stations (FSS)
- Upgraded ATC Automation (including Metering and Spacing)
- Airport Surface Traffic Control (ASTC)
- Wake Vortex Avoidance System (WVAS)
- Area Navigation (RNAV)
- Microwave Landing System (MLS)
- Aeronautical Satellite (AEROSAT)

The various combinations of the above elements that could be implemented are numerous. For the purposes of the system cost benefit analysis, one is forced to limit the analysis to a small subset of these implementation combinations. Five guidelines were used by the FAA to select the desirable set of UG3RD Generation system implementation combinations (Reference 8):

- The proposed implementation combination should be technically feasible,
- The combinations should be limited to those where synergistic effects are likely to occur or where component dependency exists,
- The alternative implementation combinations should provide a range of different types of functional benefits
- The alternative implementation combinations should provide a range of different total system cost levels, and
- The alternative siting combinations should offer a range of operation levels which will indicate the sensitivity of UG3RD costs and benefits to changes in the scope of program implementation.

The implementation combinations which have been identified for the system cost benefit study are called alternative configurations. There are five alternative configurations and a baseline configuration which are considered. A description of these configurations follows.

3.1 Baseline Configuration

The baseline configuration assumes only the existence of new items of ATC equipment that are presently slated for implementation. This includes items such as the completion of the ARTS III program and the highly probable additions to the airport facilities (e.g., ILS's and new runways). The following items are assumed to characterize the baseline configuration ATC system equipment during a portion of the time period covered by the system cost/benefit analysis (Reference 15):

- The NAS Stage A, will be implemented at all en route centers,
- ARTS III will be implemented at 63 terminals,
- ARTS II will be implemented at 69 terminals,
- Improved capability will be added to the ATCRBS,
- Extended Radar Advisory Service (ERS) may be provided at additional terminals as permitted by existing regulations,
- Ground proximity warning indicators will be installed on all air carrier aircraft.

3.2 Alternative Configurations

The alternative configurations involve both the elements of the UG3RD Generation System to be implemented and the locations at which they will be implemented. The five alternative configurations are defined as follows (Reference 15):

- Configuration 1

  a. Components

  (1) Basic Metering and Spacing (pre data link)

  (2) Manual Wake Vortex Advisory System

(3) Increased automation to the fullest extent supportable by *improved ATCRBS.*

b. Sites

(1) *Top 30 air carrier terminals*

(2) All enroute centers

- *Configuration 2*

a. Components

(1) Advanced Metering and Spacing (data link and DABS)

(2) Automated Wake Vortex Avoidance System (prediction)

(3) Discrete Address Beacon System (DABS)

(4) Increased automation to the fullest extent supportable by DABS

b. Sites

(1) Top 30 air carrier terminals

(2) All en route centers

(3) *DABS at 100 sites*

- Configuration 3

Same as Configuration 2 except DABS at 300 sites

- Configuration 4

Same as Configuration 3 except Intermittent Positive Control (IPC) at 100 DABS sites.

- Configuration 5

Same as Configuration 4, except Intermittent Positive Control at 300 DABS sites.

3.3 Impact of the Configurations on Runway Capacity

From the description of the capacity estimation methodology in Section 2, it is apparent that not all of the items which define the baseline and alternative configurations will impact the runway capacity.

To identify which items are relevant to the capacity estimates it was assumed that only the top 30 air carrier airports considered in Configuration 1 have potential capacity/delay benefits due to the implementation of the elements of the UG3RD Generation System. This assumption appears to be reasonable when one considers that the hourly scheduled demand at the remaining airports is below 26 on a Friday schedule in relation to the capacity of a single runway of about 50 operations per hour. It should be noted that all 30 of these airports are currently covered by an ARTS III system and hence the baseline and alternative configurations will be the same for all the airports as a function of time with respect to the site criteria.

The differences between the baseline and the various alternative configurations which impact capacity are those items which influence the separation standards and the level of delivery control of the aircraft to the outer marker. The differences are due to the implementation of the metering and spacing system, the wake vortex system, and improvements to the surveillance system. The relationship between the *capacity-related E&D products* and the UG3RD Generation Configurations is given in Table 3-1. The other attributes of the equivalent UG3RD Generation configurations are superfluous to the estimation of airport capacity.

TABLE 3-1
CAPACITY-RELATED E&D PRODUCTS IMPLEMENTED IN THE UG3RD GENERATION CONFIGURATIONS

	CONFIGURATION		
E&D PRODUCT	BASELINE CONFIGURATION	CONFIGURATION 1	CONFIGURATIONS 2, 3, 4, AND 5
METERING AND SPACING	MANUAL	BASIC	ADVANCED
WAKE VORTEX SYSTEMS	NONE	ADVISORY	AVOIDANCE
FINAL APPROACH MONITORING	ATCRBS	IMPROVED ATCRBS	DABS

4. CAPACITY MODEL PARAMETER VALUES

Work has recently been done to develop a common set of predicted longitudinal separation standards and other technological parameters to be used in studies related to the assessment of future performance of the elements of the FAA E&D program (Reference 5). The results of that work will be used here to provide the capacity model parameter values.

There are several caveats under which the separation standards and other parameters were developed in Reference 5, all of which are compatible with the system cost benefit study. The caveats applicable to the types of aircraft considered in this study are:

- The predicted separation standards are derived for major airports serving sophisticated well-equipped air carrier and general aviation aircraft, with a well-disciplined flow of traffic.

- VFR weather represents a visual approach condition and IFR weather conditions imply a strict applicability of the IFR rules. In terms of the capacity methodology, IFR means the strict observance of the longitudinal separation standard over the complete approach path, whereas under VFR, the aircraft are allowed to close up after being delivered to the approach gate.

- Although some policy and operational constraints have been considered, the separation standards do not constitute an operationally approved set, but are representative of what may be expected in the future, based on the current understanding of the E&D products.

The approach taken in Reference 5 was to identify what future separation standards might be as a function of time and the E&D products which would be implemented by certain time periods. Four "groups" of ATC E&D products of increasing capability were identified. These groups are characterized by the type of wake vortex system, the sophistication of the metering and spacing automation, and the improvement in surveillance/communications.

The remainder of this section will describe these groups; give the capacity model parameters associated with them; provide the best FAA estimate of when each of these groups can be expected

to be implemented; and indicate the correspondence between these groups and the capacity configurations of the system cost benefit study.

4.1 Parameter Values for ATC Groups

The groups are based on a progression of increased airport capacity and the time sequencing of their most probable implementation dates. Group 1 is the current system with a Wake Vortex Advisory System. This advisory system is supplemented in Group 2 by basic Metering and Spacing. Group 3 has a more sophisticated Wake Vortex Avoidance System and an improved surveillance system including automation aids to the controller in the form of digitized displays and computer generated alarms. Group 4 is the most sophisticated group which includes advanced Metering and Spacing, Discrete Address Beacon System (DABS), Microwave Landing System (MLS), and Area Navigation (RNAV) to aid the airside and Airport Surface Traffic Control (ASTC) and high speed exits to ensure efficient movement on the taxiways and aprons.

There are four sets of parameters needed to estimate the runway capacity. They are the separation standards, the departure rules, the metering and spacing interarrival error specifications, and aircraft type parameters. The aircraft type parameters are common to all the ATC groups and are given in Table 4-1. The other three sets of parameters are group-dependent.

Two of the group-dependent sets of parameters, the arrival separation standards and the departure rules, depend on the sophistication of the wake vortex system and the fraction of the time the wake vortex system can be considered effectively in use. The reduction in separation standards to their minimum value will only be possible when the wake vortex system indicates a safe condition in the flight path. If a safe condition does not exist, then, depending on the sophistication of the wake vortex system, a set of larger separation standards are employed. The effectiveness of WVAS is, in general, site specific. However, for the purposes of analysis the following ground rules have been established. For Groups 1 and 2 with only the Wake Vortex Advisory System, an effectiveness of 40% is appropriate. With the more sophisticated Wake Vortex Avoidance System, an effectiveness of 75% is the value to be used for analytic studies at this time (Reference 5). When wake vortex conditions exist in the approach path, the separation standards of Groups 1 and 2 revert back to the current standards

TABLE 4-1
AIRCRAFT TYPE PARAMETER VALUES

	AIRCRAFT CLASS†			
	A	B	C	D
APPROACH VELOCITIES* (KNOTS)	160	160	160	160
FINAL VELOCITIES** (KNOTS)	95	120	130	140
MEAN ARRIVAL RUNWAY OCCUPANCY TIME*** (SEC)	27	34	42	45
STANDARD DEVIATION OF ARRIVAL RUNWAY OCCUPANCY TIME*** (SEC)	4	4	4	4
NUMBER OF STANDARD DEVIATIONS TO BE PROTECTED (RUNWAY OCCUPANCY TIME)	1.65	1.65	1.65	1.65
DEPARTURE RUNWAY OCCUPANCY TIME (SEC)	40	40	40	40
MIX	+	+	+	+

†AIRCRAFT CLASSES:

CLASS A - SMALL (E.G., B-99)

CLASS B - LARGE (E.G., FH227)

CLASS C - LARGE (E.G., B727, B737)

CLASS D - HEAVY (E.G., B747, DC10, L1011)

* VELOCITY BEYOND GLIDE SLOPE GATE.

** VELOCITY BETWEEN GLIDE SLOPE GATE AND RUNWAY THRESHOLD.

*** REPRESENTATIVE OF HIGH SPEED EXITS.

\+ AIRPORT AND YEAR SPECIFIC.

and those of Groups 3 and 4 would revert back to the standards of Group 2 for both IFR and VFR. These effectiveness values and fall back properties are summarized in Table 4-2. In all cases, any advantage of the Metering and Spacing system is retained under the fall-back standards due to the fact that the performance of the Metering and Spacing system does not depend on the Wake Vortex System.

The arrival separation standards used to estimate the runway capacity are shown in Table 4-3. The detailed rationale used to determine these values can be found in Reference 5. The notation used in Table 4-3 designates the three separation standards applicable to the various aircraft pair combinations when heavy and light aircraft comprise the aircraft mix. As an example, the baseline IFR standards state that for any aircraft following a light aircraft, the standard is 3 nmi; a heavy behind a heavy, 4 nmi; and a light behind a heavy, 5 nmi. When vortex conditions exist in the final approach airspace, the fallback standards would be appropriate.

The departure rules for each of the ATC groups are listed in Table 4-4. Departures can be influenced by two factors - 1) the preceding departure or 2) the preceding arrival if both the departure and the arrival are airborne through the same runway intersection. The departure rule notation for departures on the same runway is similar to the arrival separation standard notation - any aircraft departing after a light aircraft; heavy behind a heavy; light behind a heavy. Whenever a heavy arrival (departure) is airborne through the intersection of a pair of crossing runways, the following departure (arrival) on the other runway must wait a minimum length of time before crossing the intersection if it, too, will be airborne through the intersection. This airborne intersection rule is applied to all aircraft behind a heavy.

The manner in which the metering and spacing interarrival error is specified for each of the ATC groups is to state the one sigma interarrival error at the glide slope gate and the number of sigmas to be protected against to achieve a specified probability of violation of the separation standard. Table 4-5 gives the estimates for the Metering and Spacing parameters. The detailed rationale for these estimates is found in Reference 5.

4.2 Estimated Implementation Dates for ATC Groups

The particular combination of elements which comprise the ATC

TABLE 4-2
WAKE VORTEX SYSTEM* EFFECTIVENESS

	BASELINE	GROUP 1	GROUP 2	GROUP 3	GROUP 4
SAFE CONDITIONS	0%	≤40%	≤40%	75%	75%
FALL BACK - VORTEX CONDITIONS	100%	≥60%	≥60%	25%	25%
FALL BACK TO		BASELINE	BASELINE	GROUP 2	GROUP 2

*WAKE VORTEX ADIVSORY SYSTEM FOR GROUPS 1 AND 2.

WAKE VORTEX AVOIDANCE SYSTEM FOR GROUPS 3 AND 4.

TABLE 4-3

ARRIVAL SEPARATION STANDARDS
(NAUTICAL MILES)

	BASELINE	GROUP 1	GROUP 2	GROUP 3	GROUP 4
● IFR WEATHER					
SAFE CONDITIONS		3/3/4	3/3/4	2.5/2.6/3.5	2.0/2.3/3.0
FALL BACK - VORTEX CONDITIONS	3/4/5*	3/4/5 (BASELINE)		3/3/4 (GROUP 2)	
● VFR WEATHER					
SAFE CONDITIONS	1.9/2.7/3.6	1.9/2.7/3.6	1.9/2.7/3.6	1.9/2.3/3.2	1.9/2.1/2.7
FALL BACK - VORTEX CONDITIONS				1.9/2.7/3.6 (GROUP 2)	1.9/2.7/3.6

* NOTATION: X/Y/Z

X = ANY AIRCRAFT TYPE FOLLOWING A LIGHT AIRCRAFT

Y = HEAVY AIRCRAFT FOLLOWING A HEAVY AIRCRAFT

Z = LIGHT AIRCRAFT FOLLOWING A HEAVY AIRCRAFT

TABLE 4-4

DEPARTURE RULES *
(SECONDS)

- DEPARTURES ON THE SAME RUNWAY

	BASELINE	GROUP 1	GROUP 2	GROUP 3	GROUP 4
SAFE CONDITIONS		60/60/90	60/60/90	60/60/60	60/60/60
FALL BACK - VORTEX CONDITIONS	60/90/120†	60/90/120 (BASELINE)		60/60/90 (GROUP 2)	

- MINIMUM TIME BEHIND A HEAVY AT INTERSECTION (BOTH AIRCRAFT AIRBORNE AT INTERSECTION)

	BASELINE	GROUP 1	GROUP 2	GROUP 3	GROUP 4
SAFE CONDITIONS		90	90	60	60
FALL BACK - VORTEX CONDITIONS	120	120 (BASELINE)		90 (GROUP 2)	

* ALL DEPARTURES ASSUMED TO BE CONDUCTED UNDER IFR RULES

† NOTATION: X/Y/Z
X = ANY AIRCRAFT TYPE FOLLOWING A LIGHT AIRCRAFT
Y = HEAVY AIRCRAFT FOLLOWING A HEAVY AIRCRAFT
Z = LIGHT AIRCRAFT FOLLOWING A HEAVY AIRCRAFT

TABLE 4-5

METERING AND SPACING PARAMETERS

	BASELINE	GROUP 1	GROUP 2	GROUP 3	GROUP 4
ONE SIGMA INTER-ARRIVAL ERROR AT THE GATE (SECS)	18	18	11	11	8
NUMBER OF SIGMAS TO BE PROTECTED AGAINST (PROBABILITY OF VIOLATION)	1.65 (5%)	1.65 (5%)	2.33 (1%)	2.33 (1%)	2.33 (1%)

groups discussed above were chosen not only because of their potential for increasing airport capacity but they were also chosen because of their expected time of availability. Since there are risks involved in development programs, the current best FAA estimate* as to when the groups will be fully operational at the first location is a range of years. These estimates are given in Table 4-6. The optimistic, most likely and the pessimistic dates are based on accelerated, normal or deferred priority of budget, procurement and implementation cycles. The "Most Likely" implementation date is assumed to be the most appropriate date on which to base the capacity estimates.

4.3 Correspondence Between UG3RD Generation Configurations and ATC Groups

The capacity-related E&D products contained in each UG3RD Generation Configuration were listed in Section 3.3 (see Table 3-1). Configuration 1 ultimately achieves a basic Metering and Spacing capability with a Wake Vortex Advisory System and improved ATCRBS. This configuration corresponds to ATC Groups 1 and 2. Since Group 1 is not expected to be fully operational at the first site until 1980, the baseline parameters are appropriate for Configuration 1 until 1985 when ATC Group 2 is expected to have been implemented. Thus, under Configuration 1 the parameters of ATC Group 2 would be used from 1985 to 2000; the final year in the UG3RD Generation System cost benefit analysis.

Configurations 2, 3, 4 and 5 are characterized by an advanced Metering and Spacing system, a Wake Vortex Avoidance System, and DABS. This corresponds to going to ATC Group 4. Thus by 1985, ATC Group 3 parameters will be the appropriate ones. It is assumed that ATC Group 4 will be implemented by 1990. The correspondence between the UG3RD Generation Configurations and the ATC Groups is shown in Table 4-7.

*Estimate made by FAA Office of System Engineering Management

TABLE 4-6

ESTIMATED IMPLEMENTATION DATES OF FUTURE ATC GROUPS

		Implementation**		
	Development**	Optimistic	Most Likely	Pessimistic
Group 1 - Wake Vortex Advisory System	76	79	80	82
Group 2 - Wake Vortex Advisory System Basic Metering and Spacing	77	80	82	85
Group 3 - Wake Vortex Avoidance System Basic Metering and Spacing Improved Surveillance	78	82	85	88
Group 4 - Wake Vortex Avoidance System Advanced Metering and Spacing Discrete Address Beacon System (DABS) * Microwave Landing System (MLS) * Airport Surface Traffic Control (ASTC) * Area Navigation (RNAV) * High Speed Exits	80	84	87	90

* Site Specific Requirements

** Current Best FAA Estimates

TABLE 4-7

UG3RD GENERATION CONFIGURATIONS VS ATC GROUPS

YEAR	BASELINE CONFIGURATION	CONFIGURATION 1	CONFIGURATIONS 2, 3, 4, AND 5
1975	BASELINE	BASELINE	BASELINE
1980		BASELINE	BASELINE
1985		GROUP 2	GROUP 3
1990			GROUP 4
1995			
2000			

46

5. RESULTS AND CONCLUSIONS

Airport capacity estimates were made using the methodology described in Section 2 for the UG3RD Generation Configurations defined in Section 3. The values for the model parameters were given in Section 4. The detailed results of these estimates can be found in Appendix B. Since there are many capacity numbers in Appendix B, it is edifying to reduce these results into a form which is more comprehensible. The natural way to view the results in the context of the system cost benefit study is to observe the changes in capacity over the baseline configuration for the implementation of the various alternative configurations of the UG3RD Generation System. When considering airport capacity it is also instructive to characterize the individual airports by their respective runway layouts.

The general conclusion that can be made from the estimates of capacity increases is that airports with a predominant dual-lane (dependent parallel) runway structure having a large percentage of heavy aircraft will accrue the greatest benefits from the implementation of the UG3RD Generation Configurations described in Section 3. It can also be concluded that greater capacity benefits will result under IFR conditions than under VFR conditions. Thus, the IFR capacity should approach the VFR capacity as elements of the UG3RD Generation System are implemented. It should be realized that these airport capacity conclusions alone will not determine the cost benefit ratio of the system cost benefit analysis. The considerations of the traffic demand and the distribution of IFR and VFR conditions will be used by AVP and OSEM to estimate system benefits in terms of reduction in delay.

The remainder of this section contains a more detailed discussion of the results of the capacity estimates for the top thirty air carrier airports.

5.1 IFR Capacity Results and Conclusions

The differences in capacity between the various airports and the changes in capacity due to implementation of UG3RD Generation System elements are caused by the runway usage and aircraft fleet mixes at those airports. This can be seen to some extent in Figure 5-1. This figure shows the percentage increase in IFR capacity above the baseline configuration for each airport in the year 2000 for Configuration 1 (Wake Vortex Advisory System and Basic Metering and Spacing System) and Configurations 2, 3, 4, and 5 (Wake Vortex Avoidance System and advanced

Metering and Spacing System). The airports have been grouped according to their predominate runway usage pattern.

The variation between the airports in the increase in capacity is due to the differences in fleet mixes at each airport and also the fact that each airport may use other runway patterns besides the predominate one. For example, San Francisco (SFO) operates in both a dual-lane and intersecting mode in IFR and the average increase in capacity due to both these modes is depicted in Figure 5-1. In general, the IFR intersecting runways will yield smaller increases in capacity than the dual-lane runways so that, for cases like San Francisco, the resulting increase in capacity will fall in between that of the typical dual-lane runway increase and that of the typical intersecting runway increase. Airports such as Honolulu (HNL) have a capacity increase above the average capacity increase of their respective groups. This is due to a high percentage of heavy aircraft in the aircraft mix at those airports. This is a manifestation of the fact that the IFR separation rules for systems having a Wake Vortex Avoidance System show a decrease from the current standards of 2 nmi for light aircraft behind heavy aircraft and a decrease of only 1 nmi for heavies and lights following lights.

For each of the four runway categories on Figure 5-1 a mean capacity increase has been computed. These results are shown in Table 5-1. As one can see the percentage increase in capacity is up to three times greater for the configurations having wake vortex avoidance and advanced metering and spacing than the configurations having only wake vortex advisories and basic metering and spacing. This is a result of the difference in the separation rules as well as a difference between the runway usages. The reason why some runway usage patterns benefit more than others from the implementation of elements of the UG3RD Generation System is apparent when one considers what has changed between the baseline and UG3RD Generation Configurations. In essence, the separation standards (both arrival and departure) are changed, but the other parameters such as the runway occupancy times have not changed. Thus wherever the operations depend strongly on the runway occupancy times, the capacity increases will not be as great as the capacity increases for operations that are not strongly dependent on runway occupancy time. For example, in a single runway the departing and arriving operations are each dependent on both the arrival and departure runway occupancy times, whereas for dual-lane runways the runway occupancy constraint on any operation is basically dependent

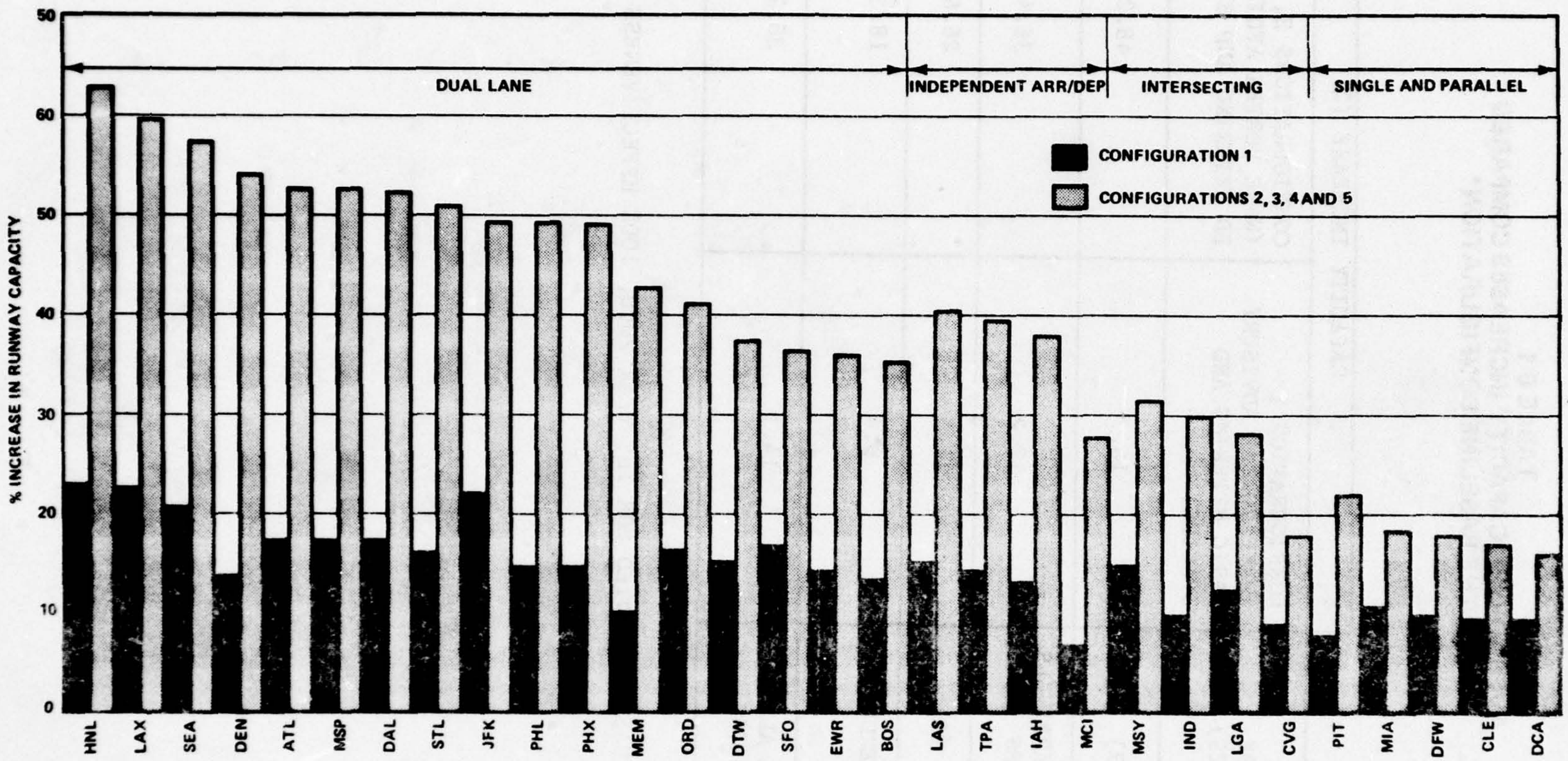


FIGURE 5-1
IFR % INCREASE IN RUNWAY CAPACITY

TABLE 5-1
AVERAGE IFR CAPACITY INCREASES COMPARED TO THE BASELINE CONFIGURATION*

RUNWAY TYPE (# OF AIRPORTS)	CAPACITY INCREASE (%)	
	CONFIGURATION 1 (WAKE VORTEX ADVISORY BASIC METERING AND SPACING)	CONFIGURATIONS 2, 3, 4, AND 5 (WAKE VORTEX AVOIDANCE ADVANCED METERING AND SPACING)
DUAL LANE (17)	16.7	48.2
INDEPENDENT ARRIVALS AND DEPARTURES (4)	12.2	36.4
INTERSECTING (4)	11.5	26.6
SINGLE/INDEPENDENT PARALLEL (5)	9.4	18.3
AVERAGE OVER ALL RUNWAY TYPES (30)	14.1	38.7

* CAPACITY INCREASES COMPUTED FOR THE YEAR 2000, 100% EFFECTIVENESS OF WVAS ASSUMED.

only on the runway occupancy time of the preceeding operation of the same type only. Thus, from the considerations discussed above, the IFR capacity increases will be greater for those airports with large percentages of heavy aircraft and runways that segregate the arrivals and departures.

5.2 VFR Capacity Results and Conclusions

The estimated increases in capacity for VFR at the thirty airports are shown in Figure 5-2. A similar runway usage breakdown to the IFR case is presented. The average VFR capacity increases for the runway types are listed in Table 5-2.

The primary result is that the VFR capacity increases are not as great as those increases estimated for IFR. This is because the decrease in the VFR arrival separation standards is not estimated to be as great as the decrease in the IFR standards.

The trend of capacity increases as a function of the type of runway usage is similar to that of IFR. There is a significant difference in capacity increases between some of the runway types such as between the dependent parallels and the independent parallels (see Figure 5-2). However, between the dependent parallels and the independent arrival and departures there is no significant difference. Among the runway categories with little significant difference in average capacity increase there is a high correlation between capacity increase and the percentage of heavy aircraft in the airport mix. This strong correlation to heavies in the mix is due to the fact that the VFR "separation standards" are only reduced for the heavy-heavy and heavy-light pairs when going from the baseline to the capacity configurations of the UG3RD Generation System.

Thus, the general conclusions that can be drawn about the expected increases in VFR capacity are similar to those of IFR except that the increases are not as great.

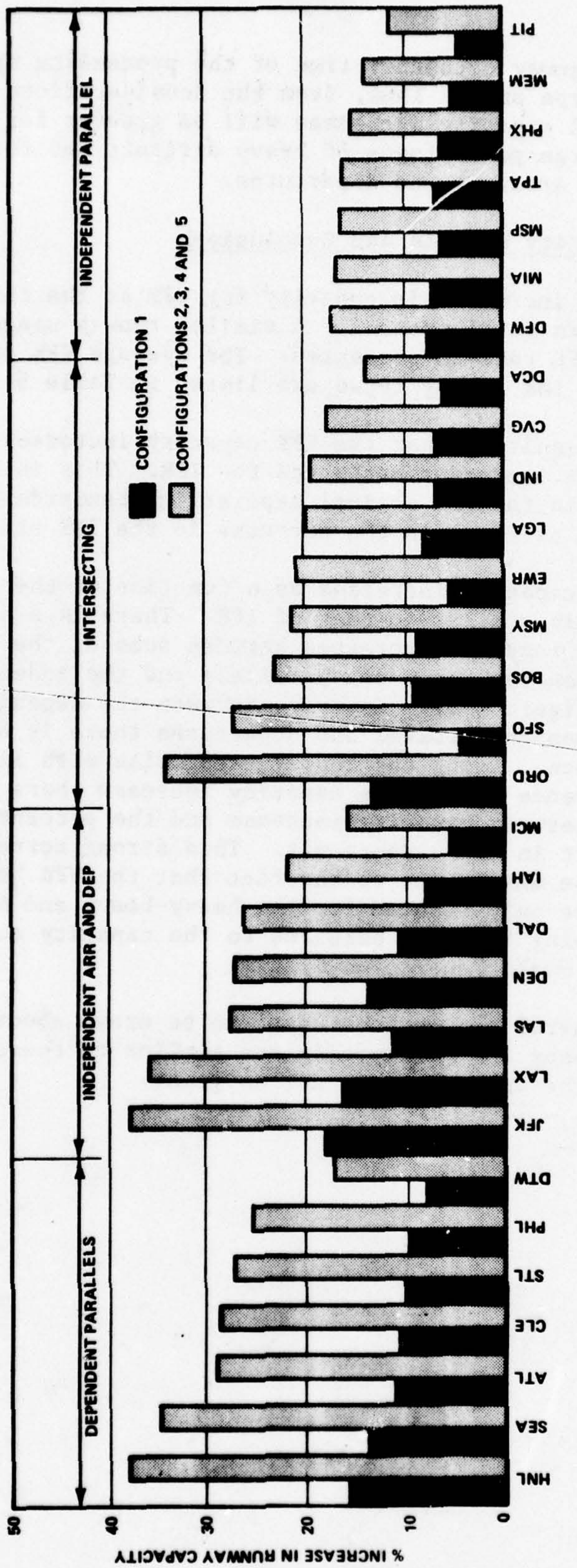


FIGURE 5-2
VFR % INCREASE IN RUNWAY CAPACITY

TABLE 5-2
AVERAGE VFR CAPACITY INCREASES COMPARED TO THE BASELINE CONFIGURATION*

RUNWAY TYPE (# OF AIRPORTS)	CAPACITY INCREASE (%)	
	CONFIGURATION 1 (WAKE VORTEX ADVISORY BASIC METERING AND SPACING)	CONFIGURATIONS 2, 3, 4, AND 5 (WAKE VORTEX AVOIDANCE ADVANCED METERING AND SPACING)
DEPENDENT PARALLELS (7)	11.1	28.4
INDEPENDENT ARRIVALS AND DEPARTURES (7)	11.8	27.3
INTERSECTING (9)	7.6	21.8
INDEPENDENT PARALLELS (7)	6.4	15.3
AVERAGE OVER ALL RUNWAY TYPES (30)	9.2	23.4

* CAPACITY INCREASES COMPUTED FOR THE YEAR 2000, 100% EFFECTIVENESS OF WVAS ASSUMED.

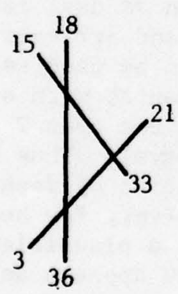
APPENDIX A

SITE SPECIFIC CONSIDERATIONS IN THE COMPUTATION OF RUNWAY CAPACITY

Most of the airports which were considered in the course of this study could be analyzed and their capacity computed using the methodology described in Section 2. For those airports, the capacities listed in Appendix B were a straightforward result of using the parameters for that airport in a computer program which incorporates the aforementioned methodology. There are some airports, however, where either this procedure could not be followed directly or an explanation of the parameters is in order. In the first case there are some multiple runway configurations at a few of the airports that required a different set of logic than the capacity estimating computer program was capable of handling. These involved the dependent IFR arrivals on the 4's at Kennedy (JFK) and the crossing runway operation on 32L and 27L at O'Hare (ORD). In the other cases, the single runway model could be used with minor modifications to the output or an explanation of the input parameters. A summary of the rationale behind the input parameters at the latter groups of airports will be given followed by a more detailed account of the modeling of JFK and ORD.

The airports whose capacity estimates are not straightforward applications methodology are Washington National (DCA), Denver (DEN), Memphis (MEM), Pittsburgh (PIT), and San Francisco (SFO). The following describes the peculiarities and the modeling of those airports.

1. WASHINGTON NATIONAL (DCA)

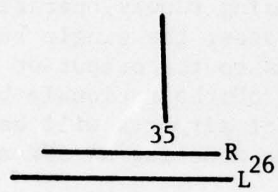


Washington National has a VFR operating procedure whereby the jet aircraft arrive and depart on the airport's main runway (18/36). Some of the non-jet air carriers will arrive and depart on the two crossing runways (3/21 and 15/33). Since a single runway model is being used to estimate the runway capacity, some assumptions have to be made which will reflect this three runway operating strategy. The following scenario provides the rationale for the assignment of model parameters.

Suppose that for every arrival and departure pair on runway 36, a departure is released on runway 3 and an arrival lands on runway 33. The sequence of this operation would be the arrival on 36, the departure on 3, the arrival on 33 and then the departure on 36. The departure on 36 could not be released until

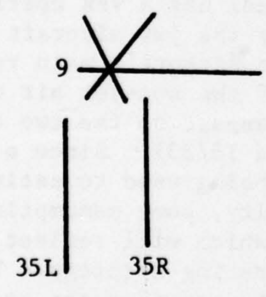
the arrival on 33 has crossed the intersection. Thus the effective runway occupancy time of the arrival on 36 is lengthened to allow for the operations on the other two runways. On the average, the runway occupancy time can be shown to be increased by about 20 seconds based on braking and acceleration assumptions. However, this type of three runway operation cannot be sustained for long because of the critical timing requirements. Therefore, it is assumed that every third arrival/departure pair is conducted on the crossing runways. This means that the additional average runway occupancy would be 6 seconds and the resultant single runway capacity should be multiplied by 1.33.

2. DENVER (DEN)



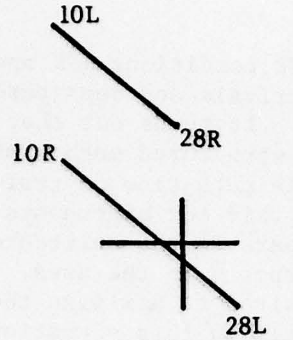
Denver's normal mode of operations is to land aircraft on 26 and depart aircraft on 35 (except heavies which are departed on 26L) [Reference 9]. In VFR conditions both 26L and 26R are used for arrivals while 35 is used independently for departures. Thus after the capacities for one arrival and one departure runway are calculated, enough arrivals are added to 26R to bring the arrival mix up to 50%. This is possible since the 26 runways are separated by 900 feet.

3. MEMPHIS (MEM)



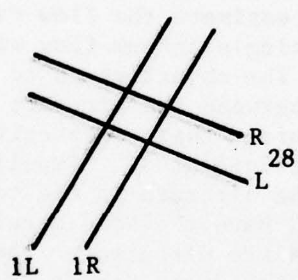
The main runways at Memphis are 35L/R and 9. Under IFR conditions the parallel runways are treated as dual lanes with departures on 35L and arrivals on 35R. Runway 9 could also be used as a departure runway dependently with arrivals on 35R (because of the open T configuration of these runways). Thus with an assumed sychronization of departures with the arrivals (very few heavies in the mix makes this a plausible assumption), the capacity appears as 1-1/2 dual lanes with 33% arrivals.

4. PITTSBURGH (PIT)



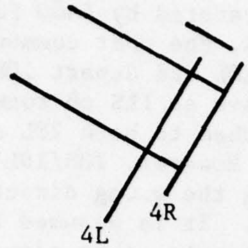
Pittsburgh has two long parallel runways, 10L/R, which are separated by 4400 feet. Currently, under IFR, the most common usage is to arrive 10L and depart 10R. By 1980, PIT will have an ILS on runway 28R allowing approaches to both 28L and 28R independently. However, 28R/10L's exits are all facing the wrong direction for arrivals on 28R. It is assumed that because of the topography, this situation will not change. Therefore, arrivals on this runway will have to stop and turn around on the runway before exiting. Thus the runway occupancy time is increased accordingly. In VFR both runways 10L and 10R are used for arrivals and departures. However, 10L does not have a taxiway leading far enough down the runway to allow most jets to take off. Therefore, after the arrival clears the exit where the departure is waiting, the departure must taxi on the runway and turn around before taking off. Thus a shorter than normal arrival runway occupancy time and a longer than normal departure runway occupancy time is specified for this runway usage.

5. SAN FRANCISCO (SFO)



San Francisco has two pairs of crossing runways. In VFR conditions the normal mode of operations is to use both pairs of crossing runways where the arrivals land on the 28 pair and the departures take off from the 1 pair. In some cases platooning feature is used whereby the arrival speeds are adjusted so that a pair of arrivals make their approaches simultaneously. After the arrivals cross the runway intersection points the departures are released as a pair. With the possibility of platooning, the airport is modeled as having a single stream of arrivals with departures released between each pair of arrivals. The VFR capacity at SFO was estimated in this manner.

6. J. F. KENNEDY INTERNATIONAL (JFK)



Under certain IFR conditions JFK operates with its arrivals and departures on runways 4L/R. It turns out that the airspace is structured such that there is a single path flow of traffic approaching this set of runways. This is due in part to the existence of the other airports in the area. Since it is required to maximize the number of arrivals in this situation, each runway of the pair receives every other arrival and runway 4L supports the departures. In most cases two departures could be released between each pair of arrivals to 4L (which has twice the spacing as a normal pair of arrivals). There are thus three steps in estimating the capacity of such a runway usage. First step determines the flow rate of a single stream of aircraft in the terminal area to be used to determine whether this area is actually the constraint on the flow. Next, the runway capacity of one of the runways is made with the appropriate expanded separations since every other arrival goes to the other runway. Then an estimate is made of the number of double departures from 4L that are lost because of the interaction between the resultant arrival spacings and the required departure-departure spacings.

The first step in this processing is to estimate the flow rate through the terminal area to JFK. The single stream flow will be modeled as having one deceleration. The objective is to determine the minimum spacing required between the aircraft in the terminal area such that during and after their respective decelerations no separation standards are violated. Simplifying assumptions in this analysis are that the aircraft in the terminal area all have the same speed and all have the same deceleration. Of course, their final velocities are different. The notational convention used in the following formulations has the form S_{XY} where S is the distance from an arbitrary point in the terminal area, X is the position designation of the aircraft in the aircraft pair (L = leading aircraft, T = trailing aircraft), and Y is the designation of the initial or final (Y=i or f) position of the aircraft in the analysis. In terms of a time-position plot of the aircraft, Figure A-1 shows schematically the case where the final velocity of the trailing aircraft is greater than or equal

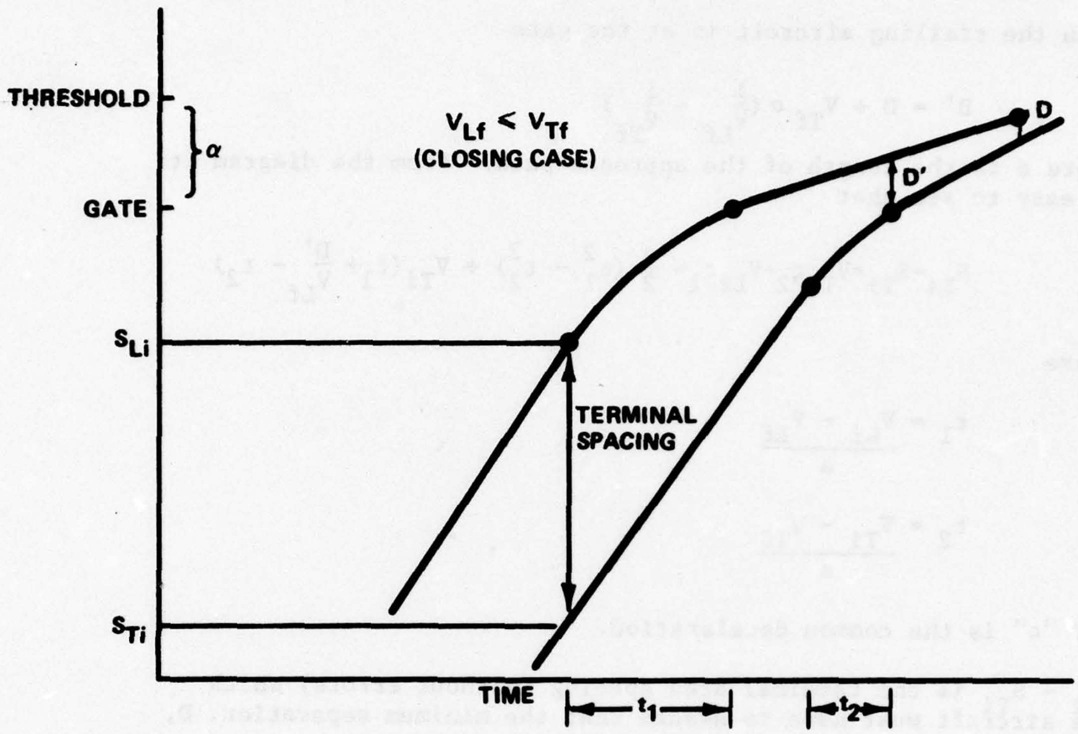


FIGURE A-1
SPACE-TIME TRAJECTORIES OF CLOSING PAIR OF AIRCRAFT

to the final velocity of the leading aircraft. The point of closest approach D, will be when the leading aircraft is at the runway threshold.

When the trailing aircraft is at the gate

$$D' = D + V_{Tf}\, \alpha \left(\frac{1}{V_{Lf}} - \frac{1}{V_{Tf}}\right)$$

Where α is the length of the approach path. From the diagram it is easy to see that

$$S_{Li} - S_{Ti} = V_{Tf} t_2 - V_{Lf} t_1 - \frac{a}{2}(t_1^2 - t_2^2) + V_{Ti}\left(t_1 + \frac{D'}{V_{Lf}} - t_2\right)$$

where

$$t_1 = \frac{V_{Li} - V_{Lf}}{a}$$

$$t_2 = \frac{V_{Ti} - V_{Tf}}{a}$$

and "a" is the common deceleration.

$S_{Li} - S_{Ti}$ is the terminal area spacing (without errors) which the aircraft must have to assure that the minimum separation, D, is not violated.

If the aircraft pair has opening characteristics (i.e., $V_{Lf} > V_{Tf}$) then the time-position plot is as shown in Figure A-2.

One can see that the lower bound on the delivery rate of the terminal area to the approach gate will be when the terminal spacing is D, the minimum separation. Thus

$$S_{Li} - S_{Ti} = D$$

Based on the various mixes of aircraft forecasted for JFK and the parameters of the implementation alternatives of the UG3RD Generation System, the terminal spacing estimates described above can be converted into flow rates that the terminal area can support for the approach path of the pair of runways. This conversion is made by considering the deterministic spacing as derived above plus a buffer due to errors in controlling the aircraft in the terminal area. Since the control errors are assumed

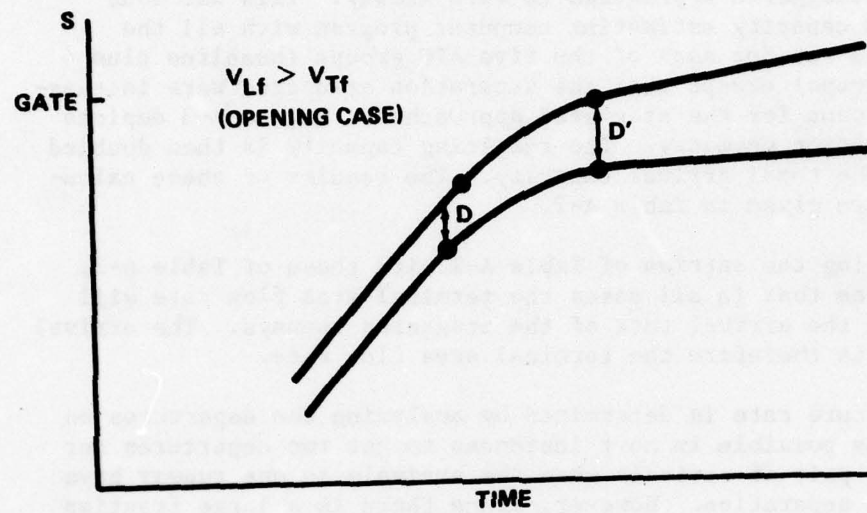


FIGURE A-2
SPACE-TIME TRAJECTORIES OF OPENING PAIR OF AIRCRAFT

to increase in time, only 75% of the error specified for the metering and spacing error at the approach gate was used in constructing the control error buffer in the terminal area. The flow rates that were determined are found in Table A-1.

The next step in the process is to calculate the runway capacity assuming staggered approaches to each runway. This was done using the capacity estimating computer program with all the parameters set for each of the five ATC groups (baseline plus 4 future groups) except that the separation standards were increased to account for the staggered approaches. Figure A-3 depicts the separation geometry. The resulting capacity is then doubled to give the total arrival capacity. The results of these calculations are given in Table A-2.

By comparing the entries of Table A-1 with those of Table A-2, one can see that in all cases the terminal area flow rate will constrain the arrival rate of the staggered runways. The arrival capacity is therefore the terminal area flow rate.

The departure rate is determined by analyzing the departures on 4L. It is possible in most instances to get two departures out between a pair of arrivals when the arrivals to one runway have increased separation. However, since there is a large fraction of heavy aircraft in the mix, the departure-departure rules may preclude the release of two consecutive departures for some sequences of departures. An estimate of the percentage of double departures that are lost was made by adjusting the error-free interarrival time separation matrix at threshold to reflect the terminal area constraints and then comparing the time it takes to release two consecutive departures. This was done for all combinations of arrival pairs and departure pairs and the proportion of time that each departure pairs did not meet the timing requirements was accounted for. Once the percentage of lost double departure gaps is known (single departure gaps are never lost with the large arrival separations being considered here), the total capacity and the percentage of arrivals could be calculated. In most cases the percentage of arrivals was 54%. The capacity of the staggered runway configuration is shown in Table A-3. Those entries with asterisks denote the cases where a dual-lane configuration has a greater capacity than the staggered configuration because all double departure gaps are lost in the staggered mode.

TABLE A-1

TERMINAL AREA FLOW RATES
AT JFK

ATC GROUPS

YEAR	BASELINE	1	2	3	4
1975	32.0 / 32.0				
1980	31.9 / 31.9	35.2 / 31.9	36.2 / 32.7	42.1 / 36.2	
1985	31.7 / 31.7	35.2 / 31.7	36.3 / 32.6	42.1 / 36.3	49.9 / 38.3
1990	31.4 / 31.4	35.3 / 31.4	36.4 / 32.3	42.0 / 36.4	49.9 / 38.4
1995	31.3 / 31.3	35.3 / 31.3	36.5 / 32.2	42.0 / 36.5	49.8 / 38.5
2000	31.1 / 31.1	35.7 / 31.1	36.8 / 32.0	42.1 / 36.8	50.0 / 38.9

W/WVAS / W/O WVAS

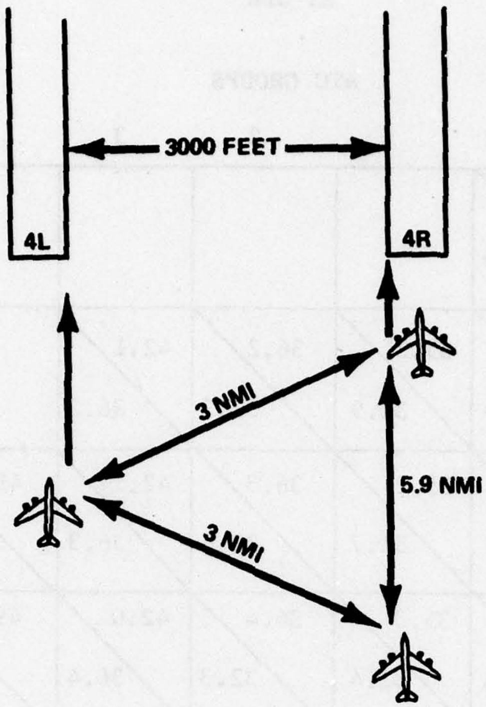


FIGURE A-3
SEPARATION GEOMETRY FOR STAGGERED APPROACHES
(PRESENT STANDARDS)

TABLE A-2

ARRIVAL CAPACITY WITH STAGGERED APPROACHES TO 4 L/R AT JFK

YEAR	BASELINE	ATC GROUP 1	ATC GROUP 2	ATC GROUP 3	ATC GROUP 4
1975	39.2 / 39.2				
1980	39.0 / 39.0	39.2 / 39.2	40.1 / 40.1	45.9 / 40.1	
1985	39.2 / 39.2	39.2 / 39.2	40.1 / 40.1	46.0 / 40.1	58.1 / 41.8
1990	39.4 / 39.4	39.4 / 39.4	40.3 / 40.3	46.2 / 40.3	58.2 / 41.9
1995	39.4 / 39.4	39.4 / 39.4	40.3 / 40.3	46.2 / 40.3	58.2 / 42.0
2000	39.5 / 39.5	39.5 / 39.5	40.4 / 40.4	46.3 / 40.4	58.3 / 42.1

W/WVAS / W/O WVAS

TABLE A-3

IFR RUNWAY CAPACITIES FOR JFK 4 L/R

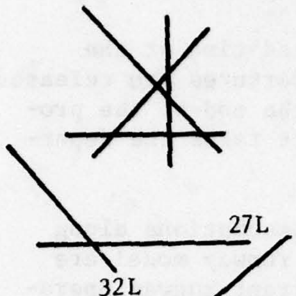
ATC GROUP

YEAR	BASELINE	1	2	3	4
1975	59.3 / 59.3				
1980	59.0 / 59.0	66.0 / 59.8	68.1 / 60.7	73.3* / 68.3	
1985	58.4 / 58.4	66.0 / 59.4	68.1 / 60.1	73.3* / 68.1	82.1* / 71.8
1990	57.4 / 57.4	66.3 / 58.9	68.3 / 59.0	73.3* / 68.3	82.4* / 72.1
1995	57.0 / 57.0	66.3 / 58.8	68.6 / 58.7	73.4* / 68.6	82.5* / 72.3
2000	55.8 / 55.8	67.4 / 58.7	67.8 / 57.3	73.5* / 69.5	83.2* / 73.4

W/WVAS / W/O WVAS

*DUAL LANE CONFIGURATION

7. CHICAGO O'HARE (ORD)



The runway configuration at O'Hare that required special attention in this study was the one where VFR aircraft arrive on 32L and depart on 27L. The complication arises because both the arrival and the departure will be airborne through the runway intersection. After a heavy aircraft flies through the intersection, the intersection should remain clear of aircraft for two minutes. Although the rule, as written, applies to the intersection after a departure, the interpretation is extended to apply to the intersection after an arrival also.

There are many ways in which this situation could be modeled within the structure of the single runway capacity model and with respect to what actually happens with operations at ORD on 32L/27L. It turns out that if the rules were applied with the interpretation above and the same mix of aircraft land on 32L as depart on 27L the present runway capacity would be a few operations above that of a single runway. However, it is known that when using this particular pair of runways at ORD, it is to the advantage of the control system (higher operations rates) and of the pilots of the heavy departures (longer runway) to depart the heavy aircraft on runway 32L north of the intersection with runway 27. To estimate the runway capacity of this scenario using a single runway model, the following assumptions were made.

- Heavy departures could be released on 32L behind heavy arrivals because of the non-closing nature of the following arrivals.
- Wake vortex protection of the intersection is provided only after arrivals because the heavy departures are on 32L.
- Since the single runway model logic assumes the mixes of departures and arrivals are the same for the purposes of determining interarrival spacings, it will appear that heavy aircraft are in the mix through the departure-departure spacing. This is somewhat compensated for by assuming that the departure-departure spacing rules hold at the intersection rather than the present 120 second rule for all operations behind a heavy. This effectively

reduces the runway occupancy time of the heavies from 120 seconds to 111 seconds in the present system.

- Anticipation of the end of the protected time at the intersection is assumed (i.e., the departures are released approximately a half a minute before the end of the protected time because this is how long it takes the departures to get to the intersection.

The results obtained by incorporating these assumptions along with the standard parameters into the single runway model are shown in Table A-4. The estimates of the current runway operation rate is close to that observed in practice at ORD. The same assumptions were used for the future systems which produced a consistent set capacity estimates.

TABLE A-4

VFR RUNWAY CAPACITIES FOR ORD
32L/27L

ATC GROUPS

YEAR	BASELINE	1	2	3	4
1975	66.4 / 66.4				
1980	65.4 / 65.4	68.7 / 65.4	71.5 / 67.9	74.0 / 71.5	
1985	64.5 / 64.5	68.3 / 64.5	71.0 / 66.9	73.8 / 71.0	81.9 / 76.2
1990	62.8 / 62.8	67.2 / 62.8	69.9 / 65.1	73.4 / 69.9	81.7 / 75.0
1995	61.4 / 61.4	66.5 / 61.4	69.1 / 63.6	73.2 / 69.1	81.5 / 74.0
2000	60.1 / 60.1	65.8 / 60.1	68.3 / 62.2	73.0 / 68.3	81.4 / 73.2

W/WVAS / W/O WVAS

APPENDIX B

CAPACITY ESTIMATES FOR THE TOP 30 AIR CARRIER AIRPORTS

Listed in this appendix is the computer output from the capacity estimating program for each of the airports (Table B-1 through B-30). The inputs which were used in making these estimates are given in the tables of Section 4. Also a comparison between these estimates and previous estimates made for the same airports will be made.

1. CAPACITY ESTIMATES

The capacity estimates in Tables B-1 through B-30 in this appendix consist of information in six columns. The first column on the left is the year for which the capacity estimates in columns 3 and 4 were made. The second column is the system package which is appropriate for that year. These system packages are synonymous to the ATC groups defined in Section 4.* For the purposes of computing the capacity estimates, each of the groups were assumed to be implemented at the optimistic dates given in Table 4-6 and capacity results were computed from that year to the year 2000. This procedure gives the necessary estimates required by Table 4-7 plus it allows for possible investigation of the results of other UG3RD Generation implementation policies on airport capacity.

Third and fourth columns give the IFR and VFR capacities, respectively. In the column heading is noted the percentage of IFR and VFR weather as given in Reference 10. As explained in Section 2.3, an airport can have a high capacity and low capacity configuration. Thus two estimates are given for each weather condition. For each runway configuration the individual runways are operated with a 50:50 mix of arrivals and departures if the runways are used for both of these operations. However, for a particular airport configuration there may be arrival-only or departure-only runways that can be operated independently. Thus, the total mix of arrivals and departures may not be 50:50. The numbers after the slashes in columns 3 and 4 are the percentages of arrivals for that configuration of runways. Also, as explained in Section 4.1, the wake vortex system may not be effective all the time. When, for reasons such as the ambient conditions, the wake vortex system can not safely support the separation standards, a set of "fall back" standards must be implemented. Thus for a given runway configuration two capacity estimates are made - one for the regular separation standards and one for the "fall back" separation standards. Both of these estimates are given along with the percentage of time each is assumed to be in effect. Figure B-1 shows the format of column 3 (or 4).

*The fifth system package is a variation of Group 4 and was not used in this study.

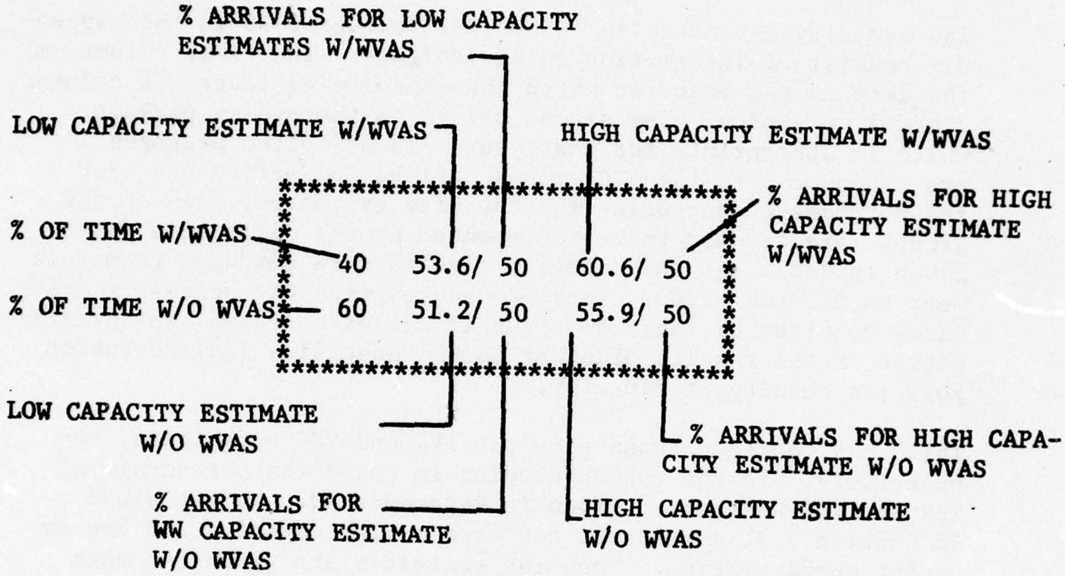


FIGURE B-1

FORMAT OF CAPACITY ESTIMATES

The fifth column shows the mix of aircraft for each year. The aircraft classifications in the mix correspond to specific aircraft types. The aircraft classifications are shown in Figure B-2. The fleet mixes were obtained from FAA-AVP-120. The sixth column denotes the types and number of runways which comprise the runway configurations. There are four entries for each year corresponding to the IFR Low, IFR High, VFR Low and VFR High estimates, top to bottom. The notations "DLN", "NNX", "NFX", "FNX", and "FFX" generally refer to dual-lane and four types of crossing runways. "ARR" means arrival only, "DEP" means departure only and "A/D" means arrivals and departures on a single runway. The mnemonics themselves should not be taken literally in all cases because of specific modeling considerations necessary at each airport.

2. CAPACITY COMPARISONS

The estimates of airport runway capacity made here for the UG3RD Generation study were compared to the estimates made for other studies where detailed checking with operational personnel was performed. For some airports, such as Honolulu and San Francisco, independent checks were made with tower personnel on the range of the capacity estimates.

Comparison of these capacity estimates were made with the FAA Report on Airport Capacity (Reference 9), the capacity estimates contained in a MITRE report on Airport Surface Traffic Control Systems (Reference 11), and the Engineered Performance Standards (EPS) of FAA-AAT (Reference 12). Of the top 30 airports, 17 yield to comparison with one or more of the aforementioned sources of capacity estimates. It should be noted that although all of these capacity estimates are of the "throughput" type, they were made based on different assumptions such as the GA traffic in the mix. Table B-31 shows these capacity comparisons.

The estimates provided by the FAA study (Reference 9) for the top 10 airports have been checked out with operational personnel and the estimates made for the UG3RD Generation Study agree favorably with them.

Aircraft Classification	Types of Aircraft[a]
Class A	Single-engine propeller-driven aircraft (e.g., PA2, PA24, C150, BE23, C172/T41, AC20, C210)
Class B	Twin-engine propeller-driven aircraft (e.g., BE18, BE99, FA27, DH6, BE55/T42, AC6T, AC50, C310)
Class C	Four-engine propeller-driven aircraft, and non-heavy jet aircraft[a] (e.g., B707/120B, B727, DC9, B737, BAC11, LR25, DC4, DC8-10, 20 series, G2/VC11, T33, T39, C500, F86, F101)
Class D	Heavy jet aircraft[b] (e.g., B747, DC10, L1011, A300, B707/300, VC10, Concorde, DC8-30, 40, 50, 60 series, C5A, C137, I162, C141, B52)

a. For aircraft type designation, see FAA Order No. 7340.1D.

b. Heavy jet aircraft are capable of at least 300,00 pounds gross takeoff weight whether or not they are operating at this weight during a particular phase of flight. (Reference: FAA Handbook 7110.8D with changes.)

FIGURE B-2

AIRCRAFT CLASSIFICATION

TABLE B-1

ATLANTA CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	WVAS USE	IFR CAPACITY 10% IFR (OPS/HR)/(% ARRIVALS)		WVAS USE	VFR CAPACITY 90% VFR (OPS/HR)/(% ARRIVALS)		MIX A	B	C	D	RUNWAY CONFIGURATION (IFR LOW / IFR HIGH / VFR LOW / VFR HIGH)
1975	BASELINE	0	107.3/ 50	107.8/ 50	0	129.8/ 50	129.8/ 50	0	4	81	15	1DLN1FFX
		100	107.3/ 50	107.8/ 50	100	129.8/ 50	129.8/ 50					1DLN1FFX
												1DLN1FFX
												1DLN1FFX
1980	BASELINE	0	107.3/ 50	107.3/ 50	0	129.0/ 50	129.0/ 50	0	2	81	17	1DLN1FFX
		100	107.3/ 50	107.3/ 50	100	129.0/ 50	129.0/ 50					1DLN1FFX
	1	40	113.1/ 50	113.1/ 50	40	132.4/ 50	132.4/ 50					1DLN1FFX
		60	107.3/ 50	107.3/ 50	60	129.0/ 50	129.0/ 50					1DLN1FFX
	2	40	117.1/ 50	117.1/ 50	40	137.6/ 50	137.6/ 50					
		60	110.3/ 50	110.3/ 50	60	134.0/ 50	134.0/ 50					
	3	75	127.4/ 50	127.4/ 50	75	139.4/ 50	139.4/ 50					
		25	117.1/ 50	117.1/ 50	25	137.6/ 50	137.6/ 50					
1985	BASELINE	0	112.8/ 50	112.8/ 50	0	142.6/ 50	142.6/ 50	0	0	79	21	2DLN
		100	112.8/ 50	112.8/ 50	100	142.6/ 50	142.6/ 50					2DLN
	1	40	122.5/ 50	122.5/ 50	40	148.2/ 50	148.2/ 50					2DLN
		60	112.8/ 5	112.8/ 50	60	142.6/ 50	142.6/ 50					2DLN
	2	40	127.5/ 50	127.5/ 50	40	154.7/ 50	154.7/ 50					
		60	115.3/ 50	115.3/ 50	60	148.6/ 50	148.6/ 50					
	3	75	148.4/ 50	148.4/ 50	75	158.3/ 50	158.3/ 50					
		25	127.5/ 50	127.5/ 50	25	154.7/ 50	154.7/ 50					
	4	75	165.7/ 50	165.7/ 50	75	175.9/ 50	175.9/ 50					
		25	135.4/ 50	135.4/ 50	25	167.2/ 50	167.2/ 50					
	5	75	153.3/ 50	153.3/ 50	75	162.1/ 50	162.1/ 50					
		25	127.5/ 50	127.5/ 50	25	154.7/ 50	154.7/ 50					
1990	BASELINE	0	111.4/ 50	111.4/ 50	0	140.7/ 50	140.7/ 50	0	0	76	24	2DLN
		100	111.4/ 50	111.4/ 50	100	140.7/ 50	140.7/ 50					2DLN
	1	40	122.1/ 50	122.1/ 50	40	147.0/ 50	147.0/ 50					2DLN
		60	111.4/ 50	111.4/ 50	60	140.7/ 50	140.7/ 50					2DLN
	2	40	127.1/ 50	127.1/ 50	40	153.3/ 50	153.3/ 50					
		60	113.9/ 50	113.9/ 50	60	146.5/ 50	146.5/ 50					
	3	75	148.0/ 50	148.0/ 50	75	157.4/ 50	157.4/ 50					
		25	127.1/ 50	127.1/ 50	25	153.3/ 50	153.3/ 50					
	4	75	165.2/ 50	165.2/ 50	75	175.3/ 50	175.3/ 50					
		25	134.9/ 50	134.9/ 50	25	165.7/ 50	165.7/ 50					
	5	75	152.9/ 50	152.9/ 50	75	161.5/ 50	161.5/ 50					
		25	127.1/ 50	127.1/ 50	25	153.3/ 50	153.3/ 50					
1995	BASELINE	0	109.4/ 50	109.4/ 50	0	137.7/ 50	137.7/ 50	0	0	71	29	2DLN
		100	109.4/ 50	109.4/ 50	100	137.7/ 50	137.7/ 50					2DLN
	1	40	121.5/ 50	121.5/ 50	40	145.1/ 50	145.1/ 50					2DLN
		60	109.4/ 50	109.4/ 50	60	137.7/ 50	137.7/ 50					2DLN
	2	40	126.5/ 50	126.5/ 50	40	151.3/ 50	151.3/ 50					
		60	111.8/ 50	111.8/ 50	60	143.3/ 50	143.3/ 50					
	3	75	147.6/ 50	147.6/ 50	75	156.1/ 50	156.1/ 50					
		25	126.5/ 50	126.5/ 50	25	151.3/ 50	151.3/ 50					
	4	75	164.6/ 50	164.6/ 50	75	174.3/ 50	174.3/ 50					
		25	134.1/ 50	134.1/ 50	25	163.3/ 50	163.3/ 50					
	5	75	152.4/ 50	152.4/ 50	75	160.7/ 50	160.7/ 50					
		25	126.5/ 50	126.5/ 50	25	151.3/ 50	151.3/ 50					
2000	BASELINE	0	107.5/ 50	107.5/ 50	0	134.5/ 50	134.5/ 50	0	0	65	35	2DLN
		100	107.5/ 50	107.5/ 50	100	134.5/ 50	134.5/ 50					2DLN
	1	40	121.0/ 50	121.0/ 50	40	143.3/ 50	143.3/ 50					2DLN
		60	107.5/ 50	107.5/ 50	60	134.5/ 50	134.5/ 50					2DLN
	2	40	126.1/ 50	126.1/ 50	40	149.3/ 50	149.3/ 50					
		60	109.8/ 50	109.8/ 50	60	139.9/ 50	139.9/ 50					
	3	75	147.1/ 50	147.1/ 50	75	154.9/ 50	154.9/ 30					
		25	126.1/ 50	126.1/ 50	25	149.3/ 50	149.3/ 50					
	4	75	164.1/ 50	164.1/ 50	75	173.4/ 50	173.4/ 50					
		25	133.4/ 50	133.4/ 50	25	161.0/ 50	161.0/ 50					
	5	75	152.0/ 50	152.0/ 50	75	160.0/ 50	160.0/ 50					
		25	126.1/ 50	126.1/ 50	25	149.3/ 50	149.3/ 50					

TABLE B-2
[illegible]ON CAPACITY ESTIMATES
UG3RD COST/BENEFIT STUDY

YEAR	SYSTEM PACKAGE	WVAS USE	IFR CAPACITY 16% IFR (OPS/HR)/(% ARRIVALS)		WVAS USE	VFR CAPACITY 84% VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D	RUNWAY CONFIGURATION	IFR LOW IFR HIGH VFR LOW VFR HIGH
1975										
	BASELINE	0	51.8/ 50	56.8/ 50	0	91.8/ 43	117.7/ 50	0 21 63 16	1A/D	
		100	51.8/ 50	56.8/ 50	100	91.8/ 43	117.7/ 50		1DLN	
									1ARR1DEP	
									.8NFX1A/D	
1980										
	BASELINE	0	51.2/ 50	55.9/ 50	0	89.6/ 44	115.6/ 50	0 13 66 21	1A/D	
		100	51.2/ 50	55.9/ 50	100	89.6/ 44	115.6/ 50		1DLN	
	1	40	53.6/ 50	60.6/ 50	40	94.5/ 41	116.9/ 50		1ARR1DEP	
		60	51.2/ 50	55.9/ 50	60	89.6/ 44	115.6/ 50		.8NFX1A/D	
	2	40	55.3/ 50	63.0/ 50	40	96.3/ 42	123.5/ 50			
		60	52.8/ 50	57.2/ 50	60	91.4/ 45	120.0/ 50			
	3	75	55.8/ 50	73.1/ 50	75	101.9/ 41	125.9/ 50			
		25	55.3/ 50	63.0/ 50	25	96.3/ 42	123.5/ 50			
1985										
	BASELINE	0	51.1/ 50	55.9/ 50	0	89.4/ 44	115.1/ 50	0 7 71 22	1A/D	
		100	51.1/ 50	55.9/ 50	100	89.4/ 44	115.1/ 50		1DLN	
	1	40	53.6/ 50	60.8/ 50	40	94.5/ 42	118.7/ 50		1ARR1DEP	
		60	51.1/ 50	55.9/ 50	60	89.4/ 44	115.1/ 50		.8NFX1A/D	
	2	40	55.3/ 50	63.3/ 50	40	96.3/ 43	123.3/ 50			
		60	52.7/ 50	57.1/ 50	60	91.2/ 45	119.4/ 50			
	3	75	55.7/ 50	73.5/ 50	75	102.1/ 41	125.8/ 50			
		25	55.3/ 50	63.3/ 50	25	96.3/ 43	123.3/ 50			
	4	75	58.9/ 50	82.4/ 50	75	107.3/ 44	137.0/ 50			
		25	58.4/ 50	67.1/ 50	25	99.8/ 45	132.2/ 50			
	5	75	55.7/ 50	76.2/ 50	75	103.4/ 42	127.5/ 50			
		25	55.3/ 50	63.3/ 50	25	96.3/ 43	123.3/ 50			
1990										
	BASELINE	0	50.8/ 50	55.5/ 50	0	88.4/ 44	113.9/ 50	0 0 75 25	1A/D	
		100	50.8/ 50	55.5/ 50	100	88.4/ 44	113.9/ 50		1DLN	
	1	40	53.5/ 50	61.0/ 50	40	94.0/ 42	118.1/ 50		1ARR1DEP	
		60	50.8/ 50	55.5/ 50	60	88.4/ 44	113.9/ 50		.8NFX1A/D	
	2	40	55.2/ 50	63.5/ 50	40	95.8/ 43	122.7/ 50			
		60	52.4/ 50	56.7/ 50	60	90.2/ 45	118.2/ 50			
	3	75	55.7/ 50	74.0/ 50	75	102.2/ 41	125.4/ 50			
		25	55.2/ 50	63.5/ 50	25	95.8/ 43	122.7/ 50			
	4	75	58.8/ 50	82.5/ 50	75	107.6/ 44	136.7/ 50			
		25	58.3/ 50	67.3/ 50	25	99.3/ 45	131.5/ 50			
	5	75	55.7/ 50	76.4/ 50	75	103.6/ 42	127.2/ 50			
		25	55.2/ 50	63.5/ 50	25	95.8/ 43	122.7/ 50			
1995										
	BASELINE	0	50.7/ 50	55.1/ 50	0	87.5/ 44	113.3/ 50	0 0 73 27	1A/D	
		100	50.7/ 50	55.1/ 50	100	87.5/ 44	113.3/ 50		1DLN	
	1	40	53.5/ 50	60.8/ 50	40	93.5/ 42	117.7/ 50		1ARR1DEP	
		60	50.7/ 50	55.1/ 50	60	87.5/ 44	113.3/ 50		.8NFX1A/D	
	2	40	55.2/ 50	63.4/ 50	40	95.3/ 43	122.3/ 50			
		60	52.3/ 50	56.3/ 50	60	89.3/ 46	117.5/ 50			
	3	75	55.7/ 50	73.9/ 50	75	102.0/ 41	125.2/ 50			
		25	55.2/ 50	63.4/ 50	25	95.3/ 43	122.3/ 50			
	4	75	58.8/ 50	82.4/ 50	75	107.4/ 44	136.5/ 50			
		25	58.3/ 50	67.2/ 50	25	98.8/ 45	131.0/ 50			
	5	75	55.7/ 50	76.3/ 50	75	103.4/ 42	127.0/ 50			
		25	55.2/ 50	63.4/ 50	25	95.3/ 43	122.3/ 50			
2000										
	BASELINE	0	50.3/ 50	53.9/ 50	0	84.8/ 45	111.3/ 50	0 0 66 34	1A/D	
		100	50.3/ 50	53.9/ 50	100	84.8/ 45	111.3/ 50		1DLN	
	1	40	53.4/ 50	60.5/ 50	40	92.0/ 41	116.6/ 50		1ARR1DEP	
		60	50.3/ 50	53.9/ 50	60	84.8/ 45	111.3/ 50		.8NFX1A/D	
	2	40	55.1/ 50	63.1/ 50	40	93.7/ 42	121.0/ 50			
		60	51.8/ 50	55.1/ 50	60	86.6/ 46	115.4/ 50			
	3	75	55.7/ 50	73.6/ 50	75	101.4/ 41	124.4/ 50			
		25	55.1/ 50	63.1/ 50	25	93.7/ 42	121.0/ 50			
	4	75	58.9/ 50	82.1/ 50	75	107.0/ 44	135.9/ 50			
		25	58.3/ 50	66.8/ 50	25	97.0/ 44	129.6/ 50			
	5	75	55.7/ 50	76.0/ 50	75	103.1/ 42	126.5/ 50			
		25	55.1/ 50	63.1/ 50	25	93.7/ 42	121.0/ 50			

TABLE B-3

CLEVELAND CAPACITY ESTIMATES
UG3RD COST BENEFITS STUDY

YEAR	SYSTEM PACKAGE	%WVAS USE	IFR CAPACITY 15% IFR (OPS/HR)/(% ARRIVALS)		%WVAS USE	VFR CAPACITY 85% VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D	RUNWAY CONFIGURATION IFR LOW / IFR HIGH / VFR LOW / VFR HIGH
1975	BASELINE	0	51.8/ 50	51.8/ 50	0	73.3/ 50	73.3/ 50	0 8 77 15	14/D
		100	51.8/ 50	51.8/ 50	100	73.3/ 50	73.3/ 50		14/D
									10LN
									10LN
1980	BASELINE	0	51.5/ 50	51.5/ 50	0	72.6/ 50	72.6/ 50	0 4 79 17	14/D
		100	51.5/ 50	51.5/ 50	100	72.6/ 50	72.6/ 50		14/D
	1	40	53.6/ 50	53.6/ 50	40	74.9/ 50	74.9/ 50		10LN
		60	51.5/ 50	51.5/ 50	60	72.6/ 50	72.6/ 50		10LN
	2	40	55.3/ 50	55.3/ 50	40	78.2/ 50	78.2/ 50		
		60	53.2/ 50	53.2/ 50	60	75.7/ 50	75.7/ 50		
	3	75	55.7/ 50	55.7/ 50	75	79.7/ 50	79.7/ 50		
		25	55.3/ 50	55.3/ 50	25	78.2/ 50	78.2/ 50		
1985	BASELINE	0	51.2/ 50	51.2/ 50	0	71.6/ 50	71.6/ 50	0 0 80 20	14/D
		100	51.2/ 50	51.2/ 50	100	71.6/ 50	71.6/ 50		14/D
	1	40	53.5/ 5	53.5/ 50	40	74.3/ 50	74.3/ 50		10LN
		60	51.2/ 50	51.2/ 50	60	71.6/ 50	71.6/ 50		10LN
	2	40	55.2/ 50	55.2/ 50	40	77.6/ 50	77.6/ 50		
		60	52.9/ 50	52.9/ 50	60	74.7/ 50	74.7/ 50		
	3	75	55.6/ 50	55.6/ 50	75	79.3/ 50	79.3/ 50		
		25	55.2/ 50	55.2/ 50	25	77.6/ 50	77.6/ 50		
	4	75	58.8/ 50	58.8/ 50	75	88.1/ 50	86.1/ 50		
		25	58.4/ 50	58.4/ 50	25	83.9/ 50	83.9/ 50		
	5	75	55.6/ 50	55.6/ 50	75	81.2/ 50	81.2/ 50		
		25	55.2/ 50	55.2/ 50	25	77.6/ 50	77.6/ 50		
1990	BASELINE	0	50.9/ 50	50.9/ 50	0	70.3/ 50	70.3/ 50	0 0 76 24	14/D
		100	50.9/ 50	50.9/ 50	100	70.3/ 50	70.3/ 50		14/D
	1	40	53.5/ 50	53.5/ 50	40	73.5/ 50	73.5/ 50		10LN
		60	50.9/ 50	50.9/ 50	60	70.3/ 50	70.3/ 50		10LN
	2	40	55.2/ 50	55.2/ 50	40	76.7/ 50	76.7/ 50		
		60	52.5/ 50	52.5/ 50	60	73.2/ 50	73.2/ 50		
	3	75	55.6/ 50	55.6/ 50	75	78.7/ 50	78.7/ 50		
		25	55.2/ 50	55.2/ 50	25	76.7/ 50	76.7/ 50		
	4	75	58.8/ 50	58.8/ 50	75	87.6/ 50	87.6/ 50		
		25	58.3/ 50	58.3/ 50	25	82.8/ 50	82.8/ 50		
	5	75	55.6/ 50	55.6/ 50	75	80.8/ 50	80.8/ 50		
		25	55.2/ 50	55.2/ 50	25	76.7/ 50	76.7/ 50		
1995	BASELINE	0	50.6/ 50	50.6/ 50	0	69.1/ 50	69.1/ 50	0 0 72 28	14/D
		100	50.6/ 50	50.6/ 50	100	69.1/ 50	69.1/ 50		14/D
	1	40	53.5/ 50	53.5/ 50	40	72.7/ 50	72.7/ 50		10LN
		60	50.6/ 50	50.6/ 50	60	69.1/ 50	69.1/ 50		10LN
	2	40	55.2/ 50	55.2/ 50	40	75.8/ 50	75.8/ 50		
		60	52.2/ 50	52.2/ 50	60	71.9/ 50	71.9/ 50		
	3	75	55.7/ 50	55.7/ 50	75	78.2/ 50	78.2/ 50		
		25	55.2/ 50	55.2/ 50	25	75.8/ 50	75.8/ 50		
	4	75	58.3/ 50	58.8/ 50	75	87.2/ 50	87.2/ 50		
		25	58.3/ 50	58.3/ 50	25	81.9/ 50	81.9/ 50		
	5	75	55.7/ 50	55.7/ 50	75	80.4/ 50	80.4/ 50		
		25	55.2/ 50	55.2/ 50	25	75.8/ 50	75.8/ 50		
2000	BASELINE	0	50.3/ 50	50.3/ 50	0	67.5/ 50	67.5/ 50	0 0 66 34	14/D
		100	50.3/ 50	50.3/ 50	100	67.5/ 50	67.5/ 50		14/D
	1	40	53.4/ 50	53.4/ 50	40	71.8/ 50	71.8/ 50		10LN
		60	50.3/ 50	50.3/ 50	60	67.5/ 50	67.5/ 50		10LN
	2	40	55.1/ 50	55.1/ 50	40	74.8/ 50	74.8/ 50		
		60	51.8/ 50	51.8/ 50	60	70.2/ 50	70.2/ 50		
	3	75	55.7/ 50	55.7/ 50	75	77.5/ 50	77.5/ 50		
		25	55.1/ 50	55.1/ 50	25	74.8/ 50	74.8/ 50		
	4	75	58.9/ 50	58.9/ 50	75	86.8/ 50	86.8/ 50		
		25	58.3/ 50	58.3/ 50	25	80.7/ 50	80.7/ 50		
	5	75	55.7/ 50	55.7/ 50	75	80.0/ 50	80.0/ 50		
		25	55.1/ 50	55.1/ 50	25	74.8/ 50	74.8/ 50		

TABLE B-4

CINNCINNATI CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	%VAS USE	IFR CAPACITY 14% IFR (OPS/HR)/(% ARRIVALS)		%VAS USE	VFR CAPACITY 86% VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D	RUNWAY CONFIGURATION	IFR LOW IFR HIGH VFR LOW VFR HIGH
1975	BASELINE	0	53.4/ 50	57.5/ 50	0	61.0/ 50	73.2/ 50	0 18 78 4	1A/D	
		100	53.4/ 50	57.5/ 50	100	61.0/ 50	73.2/ 50		1FFX	
									1A/D	
									1FFX	
1980	BASELINE	0	53.1/ 50	57.4/ 50	0	60.4/ 50	72.8/ 50	0 8 87 5	1A/D	
		100	53.1/ 50	57.4/ 50	100	60.4/ 50	72.8/ 50		1FFX	
	1	40	53.9/ 50	58.5/ 50	40	60.8/ 50	73.4/ 50		1A/D	
		60	53.1/ 50	57.4/ 50	60	60.4/ 50	72.8/ 50		1FFX	
	2	40	55.6/ 50	60.6/ 50	40	63.0/ 50	76.6/ 50			
		60	54.8/ 50	59.2/ 50	60	62.6/ 50	75.9/ 50			
	3	75	55.7/ 50	61.1/ 50	75	63.3/ 50	77.0/ 50			
		25	55.6/ 50	60.6/ 50	25	63.0/ 50	76.6/ 50			
1985	BASELINE	0	52.2/ 50	56.0/ 50	0	59.3/ 50	70.7/ 50	0 0 89 11	1A/D	
		100	52.2/ 50	56.0/ 50	100	59.3/ 50	70.7/ 50		1FFX	
	1	40	53.7/ 50	58.3/ 50	40	60.2/ 50	72.1/ 50		1A/D	
		60	52.2/ 50	56.0/ 50	60	59.3/ 50	70.7/ 50		1FFX	
	2	40	55.4/ 50	60.4/ 50	40	62.3/ 50	75.2/ 50			
		60	53.9/ 50	57.6/ 50	60	61.4/ 50	73.7/ 50			
	3	75	55.6/ 50	61.4/ 50	75	62.8/ 50	76.0/ 50			
		25	55.4/ 50	60.4/ 50	25	62.3/ 50	75.2/ 50			
	4	75	58.8/ 50	65.3/ 50	75	66.9/ 50	83.3/ 50			
		25	58.5/ 50	64.1/ 50	25	66.3/ 50	81.1/ 50			
	5	75	55.6/ 50	61.4/ 50	75	62.8/ 50	77.0/ 50			
		25	55.4/ 50	60.4/ 50	25	62.3/ 50	75.2/ 50			
1990	BASELINE	0	52.0/ 50	55.6/ 50	0	59.1/ 50	70.1/ 50	0 0 87 13	1A/D	
		100	52.0/ 50	55.6/ 50	100	59.1/ 50	70.1/ 50		1FFX	
	1	40	53.6/ 50	58.2/ 50	40	60.0/ 50	71.7/ 50		1A/D	
		60	52.0/ 50	55.6/ 50	60	59.1/ 50	70.1/ 50		1FFX	
	2	40	55.3/ 50	60.3/ 50	40	62.2/ 50	74.7/ 50			
		60	53.6/ 50	57.0/ 50	60	61.1/ 50	73.0/ 50			
	3	75	55.6/ 50	61.5/ 50	75	62.8/ 50	75.7/ 50			
		25	55.3/ 50	60.3/ 50	25	62.2/ 50	74.7/ 50			
	4	75	58.8/ 50	65.4/ 50	75	66.9/ 50	83.1/ 50			
		25	58.5/ 50	64.0/ 50	25	66.1/ 50	80.6/ 50			
	5	75	55.6/ 50	61.5/ 50	75	62.8/ 50	76.9/ 50			
		25	55.3/ 50	60.3/ 50	25	62.2/ 50	74.7/ 50			
1995	BASELINE	0	51.7/ 50	55.1/ 50	0	58.8/ 50	69.5/ 50	0 0 85 15	1A/D	
		100	51.7/ 50	55.1/ 50	100	58.8/ 50	69.5/ 50		1FFX	
	1	40	53.6/ 50	58.3/ 50	40	59.9/ 50	71.3/ 50		1A/D	
		60	51.7/ 50	55.1/ 50	60	58.8/ 50	69.5/ 50		1FFX	
	2	40	55.3/ 50	60.1/ 50	40	62.0/ 50	74.3/ 50			
		60	53.4/ 50	56.6/ 50	60	60.9/ 50	72.3/ 50			
	3	75	55.6/ 50	61.5/ 50	75	62.7/ 50	75.4/ 50			
		25	55.3/ 50	60.1/ 50	25	62.0/ 50	74.3/ 50			
	4	75	58.8/ 50	65.4/ 50	75	66.9/ 50	82.9/ 50			
		25	58.4/ 50	63.9/ 50	25	66.0/ 50	80.1/ 50			
	5	75	55.6/ 50	61.5/ 50	75	62.8/ 50	76.7/ 50			
		25	55.3/ 50	60.1/ 50	25	62.0/ 50	74.3/ 50			
2000	BASELINE	0	51.4/ 50	54.6/ 50	0	58.5/ 50	68.6/ 50	0 0 82 18	1A/D	
		100	51.4/ 50	54.6/ 50	100	58.5/ 50	68.6/ 50		1FFX	
	1	40	53.6/ 50	57.9/ 50	40	59.8/ 50	70.8/ 50		1A/D	
		60	51.4/ 50	54.6/ 50	60	58.5/ 50	68.6/ 50		1FFX	
	2	40	55.3/ 50	60.0/ 50	40	61.9/ 50	73.8/ 50			
		60	53.1/ 50	55.9/ 50	60	60.5/ 50	71.4/ 50			
	3	75	55.6/ 50	61.6/ 50	75	62.7/ 50	75.0/ 50			
		25	55.3/ 50	60.0/ 50	25	61.9/ 50	73.8/ 50			
	4	75	58.8/ 50	65.5/ 50	75	66.8/ 50	82.6/ 50			
		25	58.4/ 50	63.7/ 50	25	65.8/ 50	79.4/ 50			
	5	75	55.6/ 50	61.6/ 50	75	62.7/ 50	76.5/ 50			
		25	55.3/ 50	60.0/ 50	25	61.9/ 50	73.8/ 50			

TABLE B-5

DALLAS LOVE CAPACITY ESTIMATES
UG3RD COST/BENEFIT STUDY

YEAR	SYSTEM PACKAGE	% USE	IFR CAPACITY VIA IFR (OPS/HR)/(% ARRIVALS)		% USE	VFR CAPACITY VIA VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D	RUNWAY CONFIGURATION IFR LOW IFR HIGH VFR LOW VFR HIGH
1975	BASELINE	0	57.8/ 50	57.8/ 50	0	93.4/ 42	93.4/ 42	0 10 76 14	1DLN
		100	57.8/ 50	57.8/ 50	100	93.4/ 43	93.4/ 43		1DLN
									1ARR1DEP
									1ARR1DEP
1980	BASELINE	0	57.5/ 50	57.5/ 50	0	92.5/ 43	92.5/ 43	0 5 79 16	1DLN
		100	57.5/ 50	57.5/ 50	100	92.5/ 43	92.5/ 43		1DLN
	1	40	61.4/ 50	61.4/ 50	40	96.4/ 42	96.4/ 42		1ARR1DEP
		60	57.5/ 50	57.5/ 50	60	92.5/ 43	92.5/ 43		1ARR1DEP
	2	40	63.4/ 50	63.4/ 50	40	97.4/ 43	97.4/ 43		
		60	58.9/ 50	58.9/ 50	60	94.4/ 45	94.4/ 45		
	3	75	74.1/ 50	74.1/ 50	75	103.0/ 42	103.0/ 42		
		25	63.9/ 50	63.9/ 50	25	95.4/ 43	95.4/ 43		
1985	BASELINE	0	56.6/ 50	56.6/ 50	0	90.7/ 44	90.7/ 44	0 0 80 20	1DLN
		100	56.6/ 50	56.6/ 50	100	90.7/ 44	90.7/ 44		1DLN
	1	40	61.3/ 50	61.3/ 50	40	95.4/ 42	95.4/ 42		1ARR1DEP
		60	56.6/ 50	56.6/ 50	60	90.7/ 44	90.7/ 44		1ARR1DEP
	2	40	63.4/ 50	63.4/ 50	40	97.3/ 43	97.3/ 43		
		60	57.7/ 50	57.7/ 50	60	93.6/ 45	93.6/ 45		
	3	75	74.3/ 50	74.3/ 50	75	102.7/ 42	102.7/ 42		
		25	63.8/ 50	63.8/ 50	25	97.3/ 43	97.3/ 43		
	4	75	82.9/ 50	82.9/ 50	75	101.0/ 44	101.0/ 44		
		25	67.9/ 50	67.9/ 50	25	101.0/ 45	101.0/ 45		
	5	75	76.7/ 50	76.7/ 50	75	103.9/ 42	103.9/ 42		
		25	63.8/ 50	63.8/ 50	25	97.3/ 43	97.3/ 43		
1990	BASELINE	0	55.7/ 50	55.7/ 50	0	88.8/ 44	88.8/ 44	0 0 76 24	1DLN
		100	55.7/ 50	55.7/ 50	100	88.8/ 44	88.8/ 44		1DLN
	1	40	61.0/ 50	61.0/ 50	40	94.2/ 42	94.2/ 42		1ARR1DEP
		60	55.7/ 50	55.7/ 50	60	88.8/ 44	88.8/ 44		1ARR1DEP
	2	40	63.5/ 50	63.5/ 50	40	96.1/ 42	96.1/ 42		
		60	56.9/ 50	56.9/ 50	60	93.6/ 45	93.6/ 45		
	3	75	74.0/ 50	74.0/ 50	75	102.3/ 41	102.3/ 41		
		25	63.5/ 50	63.5/ 50	25	96.1/ 43	96.1/ 43		
	4	75	82.6/ 50	82.6/ 50	75	107.7/ 44	107.7/ 44		
		25	67.4/ 50	67.4/ 50	25	99.6/ 45	99.6/ 45		
	5	75	76.4/ 50	76.4/ 50	75	103.6/ 42	103.6/ 42		
		25	63.5/ 50	63.5/ 50	25	96.1/ 43	96.1/ 43		
1995	BASELINE	0	54.9/ 50	54.9/ 50	0	87.1/ 44	87.1/ 44	0 0 72 28	1DLN
		100	54.9/ 50	54.9/ 50	100	87.1/ 44	87.1/ 44		1DLN
	1	40	60.8/ 50	60.8/ 50	40	93.2/ 42	93.2/ 42		1ARR1DEP
		60	54.9/ 50	54.9/ 50	60	87.1/ 44	87.1/ 44		1ARR1DEP
	2	40	63.3/ 50	63.3/ 50	40	95.0/ 43	95.0/ 43		
		60	56.1/ 50	56.1/ 50	60	88.9/ 46	88.9/ 46		
	3	75	73.8/ 50	73.8/ 50	75	101.9/ 41	101.9/ 41		
		25	63.3/ 50	63.3/ 50	25	95.0/ 43	95.0/ 43		
	4	75	82.4/ 50	82.4/ 50	75	107.4/ 44	107.4/ 44		
		25	67.1/ 50	67.1/ 50	25	98.5/ 45	98.5/ 45		
	5	75	76.3/ 50	76.2/ 50	75	103.4/ 42	103.4/ 42		
		25	63.3/ 50	63.3/ 50	25	95.0/ 43	95.0/ 43		
2000	BASELINE	0	53.9/ 50	53.9/ 50	0	84.8/ 45	84.8/ 45	0 0 66 34	1DLN
		100	53.9/ 50	53.9/ 50	100	84.8/ 45	84.8/ 45		1DLN
	1	40	60.5/ 50	60.5/ 50	40	92.0/ 41	92.0/ 41		1ARR1DEP
		60	53.9/ 50	53.9/ 50	60	84.8/ 45	84.8/ 45		1ARR1DEP
	2	40	63.1/ 50	63.1/ 50	40	93.7/ 42	93.7/ 42		
		60	55.1/ 50	55.1/ 50	60	86.6/ 46	86.6/ 46		
	3	75	73.6/ 50	73.6/ 50	75	101.4/ 41	101.4/ 41		
		25	63.1/ 50	63.1/ 50	25	93.7/ 42	93.7/ 42		
	4	75	82.1/ 50	82.1/ 50	75	107.0/ 44	107.0/ 44		
		25	66.8/ 50	66.8/ 50	25	97.0/ 44	97.0/ 44		
	5	75	76.0/ 50	76.0/ 50	75	103.1/ 42	103.1/ 42		
		25	63.1/ 50	63.1/ 50	25	93.7/ 42	93.7/ 42		

TABLE B-6

WASHINGTON NATIONAL CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	%VIS USE	IFR CAPACITY 12A IFR (OPS/HR)/(% ARRIVALS)		%VFR USE	VFR CAPACITY 58A VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D	RUNWAY CONFIGURATION
1975	BASELINE	0	54.1/ 50	54.1/ 50	0	61.7/ 50	78.1/ 50	0 21 79 0	1A/D
		100	54.1/ 50	54.1/ 50	100	61.7/ 50	78.1/ 50		1A/D
									1A/D
									1FFX
1980	BASELINE	0	52.7/ 50	52.7/ 50	0	60.0/ 50	76.3/ 50	0 8 84 6	1A/D
		100	52.7/ 50	52.7/ 50	100	60.0/ 50	76.3/ 50		1A/D
	1	40	53.6/ 50	53.6/ 50	40	60.6/ 50	77.0/ 50		1A/D
		60	52.7/ 50	52.7/ 50	60	60.0/ 50	76.3/ 50		1FFX
	2	40	55.5/ 50	55.5/ 50	40	62.8/ 50	79.6/ 50		
		60	54.3/ 50	54.3/ 50	60	62.1/ 50	78.3/ 50		
	3	75	55.7/ 50	55.7/ 50	75	63.2/ 50	79.9/ 50		
		25	55.5/ 50	55.5/ 50	25	62.6/ 50	79.6/ 50		
1985	BASELINE	0	52.1/ 50	52.1/ 50	0	59.2/ 50	75.4/ 50	0 0 88 12	1A/D
		100	52.1/ 50	52.1/ 50	100	59.2/ 50	75.4/ 50		1A/D
	1	40	53.6/ 50	53.6/ 50	40	60.1/ 50	76.5/ 50		1A/D
		60	52.1/ 50	52.1/ 50	60	59.2/ 50	75.4/ 50		1FFX
	2	40	55.3/ 50	55.3/ 50	40	62.2/ 50	79.1/ 50		
		60	53.7/ 50	53.7/ 50	60	61.2/ 50	77.9/ 50		
	3	75	55.6/ 50	55.6/ 50	75	62.8/ 50	79.4/ 50		
		25	55.3/ 50	55.3/ 50	25	62.2/ 50	79.1/ 50		
	4	75	58.8/ 50	58.8/ 50	75	66.9/ 50	84.3/ 50		
		25	58.5/ 50	58.5/ 50	25	66.2/ 50	83.9/ 50		
	5	75	55.6/ 50	55.6/ 50	75	62.8/ 50	79.4/ 50		
		25	55.3/ 50	55.3/ 50	25	62.2/ 50	79.1/ 50		
1990	BASELINE	0	51.6/ 50	51.6/ 50	0	58.7/ 50	74.9/ 50	0 0 84 16	1A/D
		100	51.6/ 50	51.6/ 50	100	58.7/ 50	74.9/ 50		1A/D
	1	40	53.6/ 50	53.6/ 50	40	59.9/ 50	76.3/ 50		1A/D
		60	51.6/ 50	51.6/ 50	60	58.7/ 50	74.9/ 50		1FFX
	2	40	55.3/ 50	55.3/ 50	40	62.0/ 50	78.7/ 50		
		60	53.3/ 50	53.3/ 50	60	60.7/ 50	77.4/ 50		
	3	75	55.6/ 50	55.6/ 50	75	62.7/ 50	79.3/ 50		
		25	55.3/ 50	55.3/ 50	25	62.0/ 50	78.9/ 50		
	4	75	58.8/ 50	59.8/ 50	75	66.8/ 50	84.2/ 50		
		25	58.4/ 50	58.4/ 50	25	65.9/ 50	83.7/ 50		
	5	75	55.6/ 50	55.6/ 50	75	62.8/ 50	79.3/ 50		
		25	55.3/ 50	55.3/ 50	25	62.0/ 50	78.9/ 50		
1995	BASELINE	0	51.1/ 50	51.1/ 50	0	58.1/ 50	74.3/ 50	0 0 78 22	1A/D
		100	51.1/ 50	51.1/ 50	100	58.1/ 50	74.3/ 50		1A/D
	1	40	53.5/ 50	53.5/ 50	40	59.6/ 50	76.1/ 50		1A/D
		60	51.1/ 50	51.1/ 50	60	58.1/ 50	74.3/ 50		1FFX
	2	40	55.2/ 50	55.2/ 50	40	61.7/ 50	78.7/ 50		
		60	52.7/ 50	52.7/ 50	60	60.1/ 50	76.8/ 50		
	3	75	55.6/ 50	55.6/ 50	75	62.6/ 50	79.2/ 50		
		25	55.2/ 50	55.2/ 50	25	61.7/ 50	78.7/ 50		
	4	75	58.8/ 50	58.8/ 50	75	66.7/ 50	84.1/ 50		
		25	58.3/ 50	58.3/ 50	25	65.6/ 50	83.5/ 50		
	5	75	55.6/ 50	55.6/ 50	75	62.7/ 50	79.2/ 50		
		25	55.2/ 50	55.2/ 50	25	61.7/ 50	78.7/ 50		
2000	BASELINE	0	50.6/ 50	50.6/ 50	0	57.7/ 50	73.9/ 50	0 0 72 28	1A/D
		100	50.6/ 50	50.6/ 50	100	57.7/ 50	73.9/ 50		1A/D
	1	40	53.5/ 50	53.5/ 50	40	59.3/ 50	75.9/ 50		1A/D
		60	50.6/ 50	50.6/ 50	60	57.7/ 50	73.9/ 50		1FFX
	2	40	55.2/ 50	55.2/ 50	40	61.4/ 50	78.5/ 50		
		60	52.2/ 50	52.2/ 50	60	59.6/ 50	76.3/ 50		
	3	75	55.7/ 50	55.7/ 50	75	62.5/ 50	79.1/ 50		
		25	55.2/ 50	55.2/ 50	25	61.4/ 50	78.5/ 50		
	4	75	58.8/ 50	58.8/ 50	75	66.6/ 50	83.9/ 50		
		25	58.3/ 50	58.3/ 50	25	65.3/ 50	83.2/ 50		
	5	75	55.7/ 50	55.7/ 50	75	62.6/ 50	79.1/ 50		
		25	55.2/ 50	55.2/ 50	25	61.4/ 50	78.5/ 50		

IFR LOW
IFR HIGH
VFR LOW
VFR HIGH

TABLE B-7

DENVER CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	%VAS USE	IFR CAPACITY (DEPARTURES/ARRIVALS)	(ARRIVALS)	%VAS USE	VFR CAPACITY (DEPARTURES/ARRIVALS)	(ARRIVALS)	MIX	RUNWAY CONFIGURATION (IFR LOW / IFR HIGH / VFR LOW / VFR HIGH)
1975	BASELINE	0	52.0/ 50	59.6/ 50	0	59.6/ 50	106.2/ 50	0 16 70 14	14/0
		100	52.0/ 50	59.6/ 50	100	59.6/ 50	106.2/ 50		2ARR
									14/0
									1ARR1DEP
1980	BASELINE	0	58.2/ 50	60.1/ 50	0	94.0/ 43	107.2/ 50	[illegible] 9 78 13	1DLN
		100	58.2/ 50	60.1/ 50	100	94.0/ 43	107.2/ 50		2ARR
	1	40	61.9/ 50	61.9/ 50	40	97.3/ 42	113.9/ 50		1ARR1DEP
		60	58.2/ 50	60.1/ 50	60	94.0/ 43	107.2/ 50		1ARR1DEP
	2	40	63.9/ 50	64.1/ 50	40	99.3/ 43	113.2/ 50		
		60	59.7/ 50	62.3/ 50	60	96.0/ 44	107.5/ 50		
	3	75	74.9/ 50	74.0/ 50	75	103.2/ 42	115.7/ 50		
		25	63.9/ 50	64.1/ 50	25	99.3/ 43	113.2/ 50		
1985	BASELINE	0	57.4/ 50	59.8/ 50	0	92.2/ 44	103.3/ 50	0 0 83 17	1DLN
		100	57.4/ 50	59.8/ 50	100	92.2/ 44	103.3/ 50		2ARR
	1	40	61.4/ 50	62.1/ 50	40	96.4/ 42	111.8/ 50		1ARR1DEP
		60	57.4/ 50	59.8/ 50	60	92.2/ 44	103.3/ 50		1ARR1DEP
	2	40	64.1/ 50	64.4/ 50	40	98.3/ 43	112.1/ 50		
		60	58.6/ 50	61.9/ 50	60	94.2/ 45	103.6/ 50		
	3	75	74.4/ 50	74.5/ 50	75	103.1/ 42	115.6/ 50		
		25	64.1/ 50	64.4/ 50	25	98.3/ 43	112.1/ 50		
	4	75	83.2/ 50	92.3/ 50	75	108.3/ 45	115.1/ 50		
		25	68.7/ 50	68.6/ 50	25	102.1/ 45	112.3/ 50		
	5	75	77.0/ 50	84.7/ 50	75	104.2/ 42	120.9/ 50		
		25	64.1/ 50	64.4/ 50	25	98.3/ 43	112.1/ 50		
1990	BASELINE	0	56.1/ 50	58.5/ 50	0	89.7/ 44	100.5/ 50	0 0 78 22	1DLN
		100	56.1/ 50	58.5/ 50	100	89.7/ 44	100.4/ 50		2ARR
	1	40	61.7/ 50	61.8/ 50	40	94.8/ 42	110.0/ 50		1ARR1DEP
		60	56.1/ 50	58.5/ 50	60	89.7/ 44	100.5/ 50		1ARR1DEP
	2	40	63.7/ 50	64.0/ 50	40	96.7/ 43	110.2/ 50		
		60	57.4/ 50	60.5/ 50	60	91.6/ 45	100.8/ 50		
	3	75	74.1/ 50	74.2/ 50	75	102.5/ 41	120.9/ 50		
		25	63.7/ 50	64.0/ 50	25	96.7/ 43	110.2/ 50		
	4	75	82.8/ 50	91.2/ 50	75	107.8/ 44	120.7/ 50		
		25	67.6/ 50	68.2/ 50	25	100.3/ 45	110.3/ 50		
	5	75	76.6/ 50	83.8/ 50	75	103.8/ 42	120.4/ 50		
		25	63.7/ 50	64.[illegible]/ 50	25	96.7/ 43	110.2/ 50		
1995	BASELINE	0	55.3/ 50	58.2/ 50	0	87.9/ 44	98.4/ 50	0 0 74 26	1DLN
		100	55.3/ 50	58.2/ 50	100	87.9/ 44	98.4/ 50		2ARR
	1	40	60.5/ 50	61.6/ 50	40	93.7/ 42	106.7/ 50		1ARR1DEP
		60	55.3/ 50	58.2/ 50	60	87.9/ 44	98.4/ 50		1ARR1DEP
	2	40	63.4/ 50	63.8/ 50	40	95.5/ 43	108.9/ 50		
		60	56.5/ 50	60.2/ 50	60	89.7/ 45	99.7/ 50		
	3	75	73.9/ 50	74.0/ 50	75	102.1/ 41	120.5/ 50		
		25	63.4/ 50	63.8/ 50	25	95.5/ 43	108.9/ 50		
	4	75	82.5/ 50	93.4/ 50	75	107.5/ 44	120.4/ 50		
		25	67.3/ 50	68.0/ 50	25	99.0/ 45	108.9/ 50		
	5	75	76.3/ 50	83.1/ 50	75	103.5/ 42	120.1/ 50		
		25	63.4/ 50	63.8/ 50	25	95.5/ 43	108.9/ 50		
2000	BASELINE	0	54.2/ 50	57.3/ 50	0	85.6/ 45	94.2/ 50	0 0 68 32	1DLN
		100	54.2/ 50	57.3/ 50	100	85.6/ 45	94.2/ 50		2ARR
	1	40	60.6/ 50	61.4/ 50	40	92.4/ 41	105.3/ 50		1ARR1DEP
		60	54.2/ 50	57.3/ 50	60	85.6/ 45	94.2/ 50		1ARR1DEP
	2	40	63.1/ 50	63.6/ 50	40	94.1/ 43	107.3/ 50		
		60	55.4/ 50	59.3/ 50	60	87.3/ 46	94.3/ 50		
	3	75	73.7/ 50	73.7/ 50	75	101.5/ 41	115.8/ 50		
		25	63.1/ 50	63.6/ 50	25	94.1/ 43	107.3/ 50		
	4	75	82.7/ 50	87.5/ 50	75	107.1/ 44	115.9/ 50		
		25	66.5/ 50	67.8/ 50	25	97.5/ 44	109.2/ 50		
	5	75	76.1/ 50	82.4/ 50	75	103.2/ 42	115.7/ 50		
		25	63.1/ 50	63.6/ 50	25	94.1/ 43	107.3/ 50		

TABLE B-8

DALLAS - FT. WORTH CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	%WVAS USE	IFR CAPACITY 9% IFR (OPS/HR)/(% ARRIVALS)		%WVAS USE	VFR CAPACITY 91% VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D	RUNWAY CONFIGURATION (IFR LOW / IFR HIGH / VFR LOW / VFR HIGH)
1975	BASELINE	0	103.8/ 50	156.9/ 33	0	118.4/ 50	171.5/ 35	0 5 80 14	2A/D
		100	103.8/ 50	156.9/ 33	100	118.4/ 50	171.5/ 35		1DEP2A/D
									2A/D
									1DEP2A/D
1980	BASELINE	0	103.7/ 50	156.8/ 33	0	118.1/ 50	171.1/ 34	0 2 84 14	2A/D
		100	103.7/ 50	156.8/ 33	100	118.1/ 50	171.1/ 34		1DEP2A/D
	1	40	107.3/ 50	163.9/ 33	40	120.1/ 50	176.7/ 34		2A/D
		60	103.7/ 50	156.8/ 33	60	118.1/ 50	171.1/ 34		1DEP2A/D
	2	40	110.7/ 50	167.3/ 33	40	124.3/ 50	180.9/ 34		
		60	107.0/ 50	160.1/ 33	60	122.1/ 50	175.2/ 35		
	3	75	111.3/ 50	171.3/ 32	75	125.7/ 50	185.7/ 34		
		25	110.7/ 50	167.3/ 33	25	124.3/ 50	180.9/ 34		
1985	BASELINE	0	103.3/ 50	155.6/ 33	0	117.5/ 50	169.8/ 35	0 0 84 16	2A/D
		100	103.3/ 50	155.6/ 33	100	117.5/ 50	169.8/ 35		1DEP2A/D
	1	40	107.2/ 50	163.4/ 33	40	119.8/ 50	176.0/ 34		2A/D
		60	103.3/ 50	155.6/ 33	60	117.5/ 50	169.8/ 35		1DEP2A/D
	2	40	110.6/ 50	166.8/ 33	40	124.0/ 50	180.2/ 34		
		60	106.5/ 50	158.8/ 34	60	121.5/ 50	173.8/ 35		
	3	75	111.2/ 50	171.2/ 32	75	125.4/ 50	165.4/ 34		
		25	110.6/ 50	166.8/ 33	25	124.0/ 50	180.2/ 34		
	4	75	117.6/ 50	177.6/ 33	75	133.7/ 50	193.7/ 35		
		25	116.8/ 50	173.1/ 34	25	131.9/ 50	188.1/ 35		
	5	75	111.2/ 50	171.2/ 32	75	125.5/ 50	185.5/ 34		
		25	110.6/ 50	166.8/ 33	25	124.0/ 50	180.2/ 34		
1990	BASELINE	0	102.5/ 50	153.3/ 33	0	116.7/ 50	167.5/ 35	0 0 80 20	2A/D
		100	102.5/ 50	153.3/ 33	100	116.7/ 50	167.5/ 35		1DEP2A/D
	1	40	107.1/ 50	162.6/ 33	40	119.4/ 50	174.9/ 34		2A/D
		60	102.5/ 50	153.3/ 33	60	116.7/ 50	167.5/ 35		1DEP2A/D
	2	40	110.5/ 50	166.0/ 33	40	123.5/ 50	179.1/ 34		
		60	105.7/ 50	156.6/ 34	60	120.6/ 50	171.5/ 35		
	3	75	111.3/ 50	171.3/ 32	75	125.3/ 50	185.3/ 34		
		25	110.5/ 50	166.0/ 33	25	123.5/ 50	179.1/ 34		
	4	75	117.6/ 50	177.6/ 33	75	133.5/ 50	193.5/ 34		
		25	116.7/ 50	172.3/ 34	25	131.4/ 50	187.0/ 35		
	5	75	111.3/ 50	171.3/ 32	75	125.4/ 50	185.4/ 34		
		25	110.5/ 50	166.0/ 33	25	123.5/ 50	179.1/ 34		
1995	BASELINE	0	101.8/ 50	151.3/ 34	0	115.9/ 50	165.5/ 35	0 0 76 24	2A/D
		100	101.8/ 50	151.3/ 34	100	115.9/ 50	165.5/ 35		1DEP2A/D
	1	40	107.0/ 50	162.0/ 33	40	119.0/ 50	174.0/ 34		2A/D
		60	101.8/ 50	151.3/ 34	60	115.9/ 50	165.5/ 35		1DEP2A/D
	2	40	110.4/ 50	165.4/ 33	40	123.1/ 50	178.1/ 35		
		60	105.0/ 50	154.5/ 34	60	119.9/ 50	169.4/ 35		
	3	75	111.3/ 50	171.3/ 32	75	125.2/ 50	185.2/ 34		
		25	110.4/ 50	165.4/ 33	25	123.1/ 50	178.1/ 35		
	4	75	117.7/ 50	177.7/ 33	75	133.4/ 50	193.4/ 34		
		25	116.7/ 50	171.6/ 34	25	131.0/ 50	186.0/ 35		
	5	75	111.3/ 50	171.3/ 32	75	125.3/ 50	185.3/ 34		
		25	110.4/ 50	165.4/ 33	25	123.1/ 50	178.1/ 35		
2000	BASELINE	0	101.1/ 50	149.2/ 34	0	115.2/ 50	163.3/ 35	0 0 71 29	2A/D
		100	101.1/ 50	149.2/ 34	100	115.2/ 50	163.3/ 35		1DEP2A/D
	1	40	106.9/ 50	161.3/ 33	40	118.6/ 50	173.0/ 34		2A/D
		60	101.1/ 50	149.2/ 34	60	115.2/ 50	163.3/ 35		1DEP2A/D
	2	40	110.3/ 50	164.7/ 33	40	122.7/ 50	177.1/ 35		
		60	104.3/ 50	152.3/ 34	60	119.1/ 50	16[illegible].1/ 36		
	3	75	111.3/ 50	171.3/ 32	75	125.0/ 50	185.0/ 34		
		25	110.3/ 50	164.7/ 33	25	122.7/ 50	177.1/ 35		
	4	75	117.7/ 50	177.7/ 33	75	133.2/ 50	193.2/ 34		
		25	116.6/ 50	171.0/ 34	25	130.5/ 50	184.9/ 35		
	5	75	111.3/ 50	171.3/ 32	75	125.1/ 50	185.1/ 34		
		25	110.3/ 50	164.7/ 33	25	122.7/ 50	177.1/ 35		

TABLE B-9

DETROIT CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	MVAS USE	IFR CAPACITY 14% IFR (OPS/HR)/(% ARRIVALS)		MVAS USE	VFR CAPACITY 86% VFR (OPS/HR)/(% ARRIVALS)		MIX A	B	C	D	RUNWAY CONFIGURATION (IFR LOW / IFR HIGH / VFR LOW / VFR HIGH)
1975	BASELINE	0	78.9/ 37	78.9/ 37	0	117.2/ 50	117.2/ 50	0	14	63	23	1ARR1DEP
		100	78.9/ 37	78.9/ 37	100	117.2/ 50	117.2/ 50					1ARR1DEP
												2A/D
												2A/D
1980	BASELINE	0	105.9/ 50	105.9/ 50	0	127.6/ 50	127.6/ 50	0	4	70	26	1DLN1A/D
		100	105.9/ 50	105.9/ 50	100	127.6/ 50	127.6/ 50					1DLN1A/D
	1	40	114.2/ 50	114.2/ 50	40	132.4/ 50	132.4/ 50					1DLN1A/D
		60	105.9/ 50	105.9/ 50	60	127.6/ 50	127.6/ 50					1DLN1A/D
	2	40	118.4/ 50	118.4/ 50	40	137.6/ 50	137.6/ 50					
		60	108.7/ 50	108.7/ 50	60	132.4/ 50	132.4/ 50					
	3	75	129.3/ 50	129.3/ 50	75	140.9/ 50	140.9/ 50					
		25	118.4/ 50	118.4/ 50	25	137.6/ 50	137.6/ 50					
1985	BASELINE	0	105.0/ 50	105.0/ 50	0	126.1/ 50	126.1/ 50	0	0	70	30	1DLN1A/D
		100	105.0/ 50	105.0/ 50	100	126.1/ 50	126.1/ 50					1DLN1A/D
	1	40	114.1/ 50	114.1/ 50	40	131.7/ 50	131.7/ 50					1DLN1A/D
		60	105.0/ 50	105.0/ 50	60	126.1/ 50	126.1/ 50					1DLN1A/D
	2	40	118.4/ 50	118.4/ 50	40	136.8/ 50	136.8/ 50					
		60	107.8/ 50	107.8/ 50	60	130.8/ 50	130.8/ 50					
	3	75	129.4/ 50	129.4/ 50	75	140.4/ 50	140.4/ 50					
		25	118.4/ 50	118.4/ 50	25	136.8/ 50	136.8/ 50					
	4	75	141.1/ 50	141.1/ 50	75	153.6/ 50	153.6/ 50					
		25	125.3/ 50	125.3/ 50	25	146.6/ 50	146.6/ 50					
	5	75	131.8/ 50	131.8/ 50	75	142.8/ 50	142.8/ 50					
		25	118.4/ 50	118.4/ 50	25	136.8/ 50	136.8/ 50					
1990	BASELINE	0	104.4/ 50	104.4/ 50	0	125.1/ 50	125.1/ 50	0	0	67	33	1DLN1A/D
		100	104.4/ 50	104.4/ 50	100	125.1/ 50	125.1/ 50					1DLN1A/D
	1	40	114.0/ 50	114.0/ 50	40	131.1/ 50	131.1/ 50					1DLN1A/D
		60	104.4/ 50	104.4/ 50	60	125.1/ 50	125.1/ 50					1DLN1A/D
	2	40	118.2/ 50	118.2/ 50	40	136.2/ 50	136.2/ 50					
		60	107.1/ 50	107.1/ 50	60	129.7/ 50	129.7/ 50					
	3	75	129.3/ 50	129.3/ 50	75	140.1/ 50	140.1/ 50					
		25	118.2/ 50	118.2/ 50	25	136.2/ 50	136.2/ 50					
	4	75	141.0/ 50	141.0/ 50	75	153.4/ 50	153.4/ 50					
		25	125.1/ 50	125.1/ 50	25	145.9/ 50	145.9/ 50					
	5	75	131.7/ 50	131.7/ 50	75	142.6/ 50	142.6/ 50					
		25	118.2/ 50	118.2/ 50	25	136.2/ 50	136.2/ 50					
1995	BASELINE	0	103.4/ 50	103.4/ 50	0	123.6/ 50	123.6/ 50	0	0	62	38	1DLN1A/D
		100	103.4/ 50	103.4/ 50	100	123.6/ 50	123.6/ 50					1DLN1A/D
	1	40	113.9/ 50	113.9/ 50	40	130.3/ 50	130.3/ 50					1DLN1A/D
		60	103.4/ 50	103.4/ 50	60	123.6/ 50	123.6/ 50					1DLN1A/D
	2	40	118.1/ 50	118.1/ 50	40	135.3/ 50	135.3/ 50					
		60	106.2/ 50	106.2/ 50	60	128.2/ 50	128.2/ 50					
	3	75	129.2/ 50	129.2/ 50	75	139.6/ 50	139.6/ 50					
		25	118.1/ 50	118.1/ 50	25	135.3/ 50	135.3/ 50					
	4	75	140.9/ 50	140.9/ 50	75	153.0/ 50	153.0/ 50					
		25	124.8/ 50	124.8/ 50	25	144.9/ 50	144.9/ 50					
	5	75	131.6/ 50	131.6/ 50	75	142.2/ 50	142.2/ 50					
		25	118.1/ 50	118.1/ 50	25	135.3/ 50	135.3/ 50					
2000	BASELINE	0	102.5/ 50	102.5/ 50	0	121.9/ 50	121.9/ 50	0	0	55	45	1DLN1A/D
		100	102.5/ 50	102.5/ 50	100	121.9/ 50	121.9/ 50					1DLN1A/D
	1	40	113.8/ 50	113.8/ 50	40	129.4/ 50	129.4/ 50					1DLN1A/D
		60	102.5/ 50	102.5/ 50	60	121.9/ 50	121.9/ 50					1DLN1A/D
	2	40	118.1/ 50	118.1/ 50	40	134.3/ 50	134.3/ 50					
		60	105.3/ 50	105.3/ 50	60	126.3/ 50	126.3/ 50					
	3	75	129.1/ 50	129.1/ 50	75	139.1/ 50	139.1/ 50					
		25	118.1/ 50	118.1/ 50	25	134.3/ 50	134.3/ 50					
	4	75	140.9/ 50	140.9/ 50	75	152.6/ 50	152.6/ 50					
		25	124.7/ 50	124.7/ 50	25	143.8/ 50	143.8/ 50					
	5	75	131.7/ 50	131.7/ 50	75	141.9/ 50	141.9/ 50					
		25	118.1/ 50	118.1/ 50	25	134.3/ 50	134.3/ 50					

TABLE B-10

NEWARK CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	%WVAS USE	IFR CAPACITY 15% IFR (OPS/HR)/(% ARRIVALS)		%WVAS USE	VFR CAPACITY 85% VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D	RUNWAY CONFIGURATION	IFR LOW IFR HIGH VFR LOW VFR HIGH
1975	BASELINE	0	51.3/ 50	56.2/ 50	0	58.7/ 50	78.7/ 50	0 10 70 20	14/D	
		100	51.3/ 50	56.2/ 50	100	58.7/ 50	78.7/ 50		1DLN	
									14/D	
									1NNX	
1980	BASELINE	0	51.3/ 50	56.8/ 50	0	58.5/ 50	79.8/ 50	0 2 79 19	14/D	
		100	51.3/ 50	56.8/ 50	100	58.5/ 50	79.8/ 50		1DLN	
	1	40	53.6/ 50	61.3/ 50	40	59.3/ 50	79.8/ 50		14/D	
		60	51.3/ 50	56.8/ 50	60	58.5/ 50	79.8/ 50		1NNX	
	2	40	55.3/ 50	63.8/ 50	40	61.9/ 50	83.6/ 50			
		60	53.0/ 50	58.1/ 50	60	60.5/ 50	83.6/ 50			
	3	75	55.7/ 50	74.1/ 50	75	62.7/ 50	85.5/ 50			
		25	55.3/ 50	63.8/ 50	25	61.9/ 50	83.6/ 50			
1965	BASELINE	0	50.9/ 50	55.7/ 50	0	58.0/ 50	78.5/ 50	0 0 76 24	14/D	
		100	50.9/ 50	55.7/ 50	100	58.0/ 50	78.5/ 50		1DLN	
	1	40	53.5/ 50	61.0/ 50	40	59.5/ 50	76.5/ 50		14/D	
		60	50.9/ 50	55.7/ 50	60	58.0/ 50	78.5/ 50		1NNX	
	2	40	55.2/ 50	63.5/ 50	40	61.6/ 50	82.2/ 50			
		60	52.5/ 50	56.9/ 50	60	59.9/ 50	82.2/ 50			
	3	75	55.6/ 50	74.0/ 50	75	62.6/ 50	84.6/ 50			
		25	55.2/ 50	63.5/ 50	25	61.6/ 50	82.2/ 50			
	4	75	58.3/ 50	82.6/ 50	75	66.7/ 50	95.3/ 50			
		25	58.3/ 50	67.4/ 50	25	65.5/ 50	89.3/ 50			
	5	75	55.6/ 50	76.4/ 50	75	62.6/ 50	87.3/ 50			
		25	55.2/ 50	63.5/ 50	25	61.6/ 50	82.2/ 50			
1990	BASELINE	0	50.7/ 50	55.1/ 50	0	57.7/ 50	77.7/ 50	0 0 73 27	14/D	
		100	50.7/ 50	55.1/ 50	100	57.7/ 50	77.7/ 50		1DLN	
	1	40	53.5/ 50	60.8/ 50	40	59.4/ 50	77.7/ 50		14/D	
		60	50.7/ 50	55.1/ 50	60	57.7/ 50	77.7/ 50		1NNX	
	2	40	55.2/ 50	63.4/ 50	40	61.4/ 50	81.3/ 50			
		60	52.3/ 50	56.3/ 50	60	59.7/ 50	81.3/ 50			
	3	75	55.7/ 50	73.9/ 50	75	62.5/ 50	83.9/ 50			
		25	55.2/ 50	63.4/ 50	25	61.4/ 50	81.3/ 50			
	4	75	58.8/ 50	82.4/ 50	75	66.6/ 50	94.9/ 50			
		25	58.3/ 50	67.2/ 50	25	65.3/ 50	88.3/ 50			
	5	75	55.7/ 50	76.3/ 50	75	62.6/ 50	86.9/ 50			
		25	55.2/ 50	63.4/ 50	25	61.4/ 50	81.3/ 50			
1995	BASELINE	0	50.2/ 50	51.6/ 50	0	56.9/ 50	71.9/ 50	0 0 32 68	14/D	
		100	50.2/ 50	51.6/ 50	100	56.9/ 50	71.9/ 50		1DLN	
	1	40	53.6/ 50	61.5/ 50	40	58.7/ 50	71.9/ 50		14/D	
		60	50.2/ 50	51.6/ 50	60	56.9/ 50	71.9/ 50		1NNX	
	2	40	55.3/ 50	64.1/ 50	40	60.7/ 50	75.0/ 50			
		60	51.8/ 50	53.2/ 50	60	58.8/ 50	75.0/ 50			
	3	75	55.8/ 50	73.6/ 50	75	61.9/ 50	80.9/ 50			
		25	55.3/ 50	64.1/ 50	25	60.7/ 50	75.0/ 50			
	4	75	59.0/ 50	83.4/ 50	75	65.9/ 50	93.6/ 50			
		25	58.4/ 50	67.7/ 50	25	64.5/ 50	80.8/ 50			
	5	75	55.8/ 50	77.1/ 50	75	61.9/ 50	85.8/ 50			
		25	55.3/ 50	64.1/ 50	25	60.7/ 50	75.0/ 50			
2000	BASELINE	0	50.1/ 50	53.5/ 50	0	57.1/ 50	75.5/ 50	0 0 63 37	14/D	
		100	50.1/ 50	53.5/ 50	100	57.1/ 50	75.5/ 50		1DLN	
	1	40	53.4/ 50	60.5/ 50	40	59.0/ 50	75.5/ 50		14/D	
		60	50.1/ 50	53.5/ 50	60	57.1/ 50	75.5/ 50		1NNX	
	2	40	55.1/ 50	63.0/ 50	40	61.1/ 50	78.9/ 50			
		60	51.7/ 50	54.7/ 50	60	59.0/ 50	78.9/ 50			
	3	75	55.7/ 50	73.5/ 50	75	62.4/ 50	82.3/ 50			
		25	55.1/ 50	63.0/ 50	25	61.1/ 50	78.9/ 50			
	4	75	58.9/ 50	82.0/ 50	75	66.5/ 50	93.8/ 50			
		25	58.2/ 50	66.6/ 50	25	64.9/ 50	85.4/ 50			
	5	75	55.7/ 50	75.9/ 50	75	62.4/ 50	85.9/ 50			
		25	55.1/ 50	63.0/ 50	25	61.1/ 50	78.9/ 50			

TABLE B-11

HONOLULU CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	WVAS USE	IFR CAPACITY 1% IFR (OPS/HR)/(% ARRIVALS)		WVAS USE	VFR CAPACITY 99% VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D	RUNWAY CONFIGURATION IFR LOW IFR HIGH VFR LOW VFR HIGH
1975	BASELINE	0	52.0/ 50	52.0/ 50	0	66.1/ 67	66.1/ 67	0 0 60 40	1FFX
		100	52.0/ 50	52.0/ 50	100	66.1/ 67	66.1/ 67		1FFX
									1NFX
									1NFX
1980	BASELINE	0	94.4/ 26	94.4/ 26	0	113.7/ 50	113.7/ 50	0 0 55 45	1DEP1A/D
		100	94.4/ 26	94.4/ 26	100	113.7/ 50	113.7/ 50		1DEP1A/D
	1	40	106.8/ 25	106.8/ 25	40	117.7/ 50	117.7/ 50		2A/D
		60	94.4/ 26	94.4/ 26	60	113.7/ 50	113.7/ 50		2A/D
	2	40	108.5/ 25	108.5/ 25	40	121.8/ 50	121.8/ 50		
		60	95.9/ 27	95.9/ 27	60	117.4/ 50	117.4/ 50		
	3	75	115.7/ 24	115.7/ 24	75	124.4/ 50	124.4/ 50		
		25	108.5/ 25	108.5/ 25	25	121.8/ 50	121.8/ 50		
1985	BASELINE	0	93.6/ 27	93.6/ 27	0	113.5/ 50	113.5/ 50	0 0 51 49	1DEP1A/D
		100	93.6/ 27	93.6/ 27	100	113.5/ 50	113.5/ 50		1DEP1A/D
	1	40	106.8/ 25	106.8/ 25	40	117.6/ 50	117.6/ 50		2A/D
		60	93.6/ 27	93.6/ 27	60	113.5/ 50	113.5/ 50		2A/D
	2	40	108.5/ 25	108.5/ 25	40	121.6/ 50	121.6/ 50		
		60	95.2/ 27	95.2/ 27	60	117.3/ 50	117.3/ 50		
	3	75	115.8/ 24	115.8/ 24	75	124.3/ 50	124.3/ 50		
		25	108.5/ 25	108.5/ 25	25	121.6/ 50	121.6/ 50		
	4	75	118.9/ 25	118.9/ 25	75	132.5/ 50	132.5/ 50		
		25	111.6/ 26	111.6/ 26	25	129.2/ 50	129.2/ 50		
	5	75	115.8/ 24	115.8/ 24	75	124.5/ 50	124.5/ 50		
		25	108.5/ 25	108.5/ 25	25	121.6/ 50	121.6/ 50		
1990	BASELINE	0	93.1/ 27	93.1/ 27	0	113.4/ 50	113.4/ 50	0 0 48 52	1DEP1A/D
		100	93.1/ 27	93.1/ 27	100	113.4/ 50	113.4/ 50		1DEP1A/D
	1	40	106.8/ 25	106.8/ 25	40	117.5/ 50	117.5/ 50		2A/D
		60	93.1/ 27	93.1/ 27	60	113.4/ 50	113.4/ 50		2A/D
	2	40	108.5/ 25	108.5/ 25	40	121.5/ 50	121.5/ 50		
		60	94.7/ 27	94.7/ 27	60	117.2/ 50	117.2/ 50		
	3	75	115.8/ 24	115.8/ 24	75	124.2/ 50	124.2/ 50		
		25	108.5/ 25	108.5/ 25	25	121.5/ 50	121.5/ 50		
	4	75	119.0/ 25	119.0/ 25	75	132.4/ 50	132.4/ 50		
		25	111.6/ 26	111.6/ 26	25	129.1/ 50	129.1/ 50		
	5	75	115.8/ 24	115.8/ 24	75	124.4/ 50	124.4/ 50		
		25	108.5/ 25	108.5/ 25	25	121.5/ 50	121.5/ 50		
1995	BASELINE	0	92.7/ 27	92.7/ 27	0	113.4/ 50	113.4/ 50	0 0 45 55	1DEP1A/D
		100	92.7/ 27	92.7/ 27	100	113.4/ 50	113.4/ 50		1DEP1A/D
	1	40	106.8/ 25	106.8/ 25	40	117.4/ 50	117.4/ 50		2A/D
		60	92.7/ 27	92.7/ 27	60	113.4/ 50	113.4/ 50		2A/D
	2	40	108.6/ 25	108.6/ 25	40	121.4/ 50	121.4/ 50		
		60	94.3/ 27	94.3/ 27	60	117.2/ 50	117.2/ 50		
	3	75	115.8/ 24	115.8/ 24	75	124.1/ 50	124.1/ 50		
		25	108.6/ 25	108.6/ 25	25	121.4/ 50	121.4/ 50		
	4	75	119.0/ 25	119.0/ 25	75	132.2/ 50	132.2/ 50		
		25	111.7/ 26	111.7/ 26	25	129.1/ 50	129.1/ 50		
	5	75	115.8/ 24	115.8/ 24	75	124.3/ 50	124.3/ 50		
		25	108.6/ 25	108.6/ 25	25	121.4/ 50	121.4/ 50		
2000	BASELINE	0	92.3/ 27	92.3/ 27	0	113.4/ 50	113.4/ 50	0 0 41 59	1DEP1A/D
		100	92.3/ 27	92.3/ 27	100	113.4/ 50	113.4/ 50		1DEP1A/D
	1	40	107.0/ 25	107.0/ 25	40	117.4/ 50	117.4/ 50		2A/D
		60	92.3/ 27	92.3/ 27	60	113.4/ 50	113.4/ 50		2A/D
	2	40	108.7/ 25	108.7/ 25	40	121.4/ 50	121.4/ 50		
		60	93.9/ 27	93.9/ 27	60	117.2/ 50	117.2/ 50		
	3	75	115.8/ 24	115.8/ 24	75	124.0/ 50	124.0/ 50		
		25	108.7/ 25	108.7/ 25	25	121.4/ 50	121.4/ 50		
	4	75	119.0/ 25	119.0/ 25	75	132.1/ 50	132.1/ 50		
		25	111.8/ 26	111.8/ 26	25	129.0/ 50	129.0/ 50		
	5	75	115.8/ 24	115.8/ 24	75	124.1/ 50	124.1/ 50		
		25	108.7/ 25	108.7/ 25	25	121.4/ 50	121.4/ 50		

TABLE B-12

HOUSTON CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	AVAS USE	IFR CAPACITY 15% IFR (OPS/HR)/(% ARRIVALS)		AVAS USE	VFR CAPACITY 85% VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D	RUNWAY CONFIGURATION (IFR LOW / IFR HIGH / VFR LOW / VFR HIGH)
1975	BASELINE	0	83.2/ 36	83.2/ 36	0	93.7/ 43	99.7/ 70	0 4 82 14	1ARR1DEP
		100	83.2/ 36	83.2/ 36	100	93.7/ 43	99.7/ 70		1ARR1DEP
									1ARR1DEP
									1ARR1A/D
1980	BASELINE	0	82.3/ 36	82.3/ 36	0	92.7/ 44	99.2/ 70	0 2 82 16	1ARR1DEP
		100	82.3/ 36	82.3/ 36	100	92.7/ 44	99.2/ 70		1ARR1DEP
	1	40	87.2/ 36	87.2/ 36	40	96.6/ 42	100.3/ 70		1ARR1DEP
		60	82.3/ 36	82.3/ 36	60	92.7/ 44	99.2/ 70		1ARR1A/D
	2	40	88.4/ 36	88.4/ 36	40	98.5/ 43	104.3/ 70		
		60	83.3/ 37	83.3/ 37	60	94.6/ 45	103.1/ 71		
	3	75	97.2/ 38	97.2/ 38	75	103.1/ 42	105.9/ 70		
		25	88.4/ 36	88.4/ 36	25	98.5/ 43	104.3/ 70		
1985	BASELINE	0	80.5/ 37	80.5/ 37	0	90.7/ 44	98.2/ 70	0 0 80 20	1ARR1DEP
		100	80.5/ 37	80.5/ 37	100	90.7/ 44	98.2/ 70		1ARR1DEP
	1	40	86.5/ 36	86.5/ 36	40	95.4/ 42	99.5/ 70		1ARR1DEP
		60	80.5/ 37	80.5/ 37	60	90.7/ 44	98.2/ 70		1ARR1A/D
	2	40	87.6/ 37	87.6/ 37	40	97.3/ 43	103.5/ 70		
		60	81.5/ 38	81.5/ 38	60	92.6/ 45	102.0/ 70		
	3	75	97.1/ 38	97.1/ 38	75	102.7/ 42	105.4/ 70		
		25	87.6/ 37	87.6/ 37	25	97.3/ 43	103.5/ 70		
	4	75	105.8/ 43	105.8/ 43	75	108.0/ 44	114.8/ 71		
		25	89.8/ 38	89.8/ 38	25	101.0/ 45	111.1/ 70		
	5	75	102.1/ 41	102.1/ 41	75	103.9/ 42	106.6/ 71		
		25	87.6/ 37	87.6/ 37	25	97.3/ 43	103.5/ 70		
1990	BASELINE	0	79.6/ 37	79.6/ 37	0	89.7/ 44	97.7/ 70	0 0 78 22	1ARR1DEP
		100	79.6/ 37	79.6/ 37	100	89.7/ 44	97.7/ 70		1ARR1DEP
	1	40	86.1/ 36	86.1/ 36	40	94.8/ 42	99.1/ 70		1ARR1DEP
		60	79.6/ 37	79.6/ 37	60	89.7/ 44	97.7/ 70		1ARR1A/D
	2	40	87.3/ 37	87.3/ 37	40	96.7/ 43	103.1/ 70		
		60	80.6/ 38	80.6/ 38	60	91.6/ 45	101.5/ 70		
	3	75	97.1/ 38	97.1/ 38	75	102.5/ 41	105.1/ 70		
		25	87.3/ 37	87.3/ 37	25	96.7/ 43	103.1/ 70		
	4	75	105.6/ 43	105.6/ 43	75	107.8/ 44	114.6/ 71		
		25	89.4/ 38	89.4/ 38	25	100.3/ 45	110.6/ 70		
	5	75	101.9/ 41	101.9/ 41	75	103.8/ 42	106.4/ 71		
		25	87.3/ 37	87.3/ 37	25	96.7/ 43	103.1/ 70		
1995	BASELINE	0	77.3/ 37	77.3/ 37	0	87.1/ 44	96.4/ 70	0 0 72 28	1ARR1DEP
		100	77.3/ 37	77.3/ 37	100	87.1/ 44	96.4/ 70		1ARR1DEP
	1	40	85.2/ 36	85.2/ 36	40	93.2/ 42	98.1/ 70		1ARR1DEP
		60	77.3/ 37	77.3/ 37	60	87.1/ 44	96.4/ 70		1ARR1A/D
	2	40	86.4/ 37	86.4/ 37	40	95.0/ 43	101.9/ 70		
		60	78.3/ 38	78.3/ 38	60	88.9/ 46	100.1/ 70		
	3	75	96.9/ 38	96.9/ 38	75	101.9/ 41	104.4/ 70		
		25	86.4/ 37	86.4/ 37	25	95.0/ 43	101.9/ 70		
	4	75	105.1/ 43	105.1/ 43	75	107.4/ 44	114.0/ 71		
		25	88.5/ 38	88.5/ 38	25	98.5/ 45	109.3/ 70		
	5	75	101.4/ 41	101.4/ 41	75	103.4/ 42	106.0/ 70		
		25	86.4/ 37	86.4/ 37	25	95.0/ 43	101.9/ 70		
2000	BASELINE	0	76.0/ 38	76.0/ 38	0	85.6/ 45	95.7/ 70	0 0 68 32	1ARR1DEP
		100	76.0/ 38	76.0/ 38	100	85.6/ 45	95.7/ 70		1ARR1DEP
	1	40	84.8/ 36	84.8/ 36	40	92.4/ 41	97.5/ 70		1ARR1DEP
		60	76.0/ 38	76.0/ 38	60	85.6/ 45	95.7/ 70		1ARR1A/D
	2	40	85.9/ 37	85.9/ 37	40	94.1/ 43	101.3/ 70		
		60	76.9/ 39	76.9/ 39	60	87.3/ 46	99.3/ 70		
	3	75	96.9/ 38	96.9/ 38	75	101.5/ 41	104.0/ 70		
		25	85.9/ 37	85.9/ 37	25	94.1/ 43	101.3/ 70		
	4	75	104.8/ 43	104.8/ 43	75	107.1/ 44	113.7/ 71		
		25	88.0/ 38	88.0/ 38	25	97.5/ 44	108.5/ 70		
	5	75	101.2/ 41	101.2/ 41	75	103.2/ 42	105.7/ 70		
		25	85.9/ 37	85.9/ 37	25	94.1/ 43	101.3/ 70		

TABLE B-13
INDIANAPOLIS CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	MVAS USE	IFR CAPACITY 15% IFR (OPS/HR)/(% ARRIVALS)		MVAS USE	VFR CAPACITY 85% VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D	RUNWAY CONFIGURATION IFR LOW / IFR HIGH / VFR LOW / VFR HIGH
1975	BASELINE	0	62.0/ 50	62.0/ 50	0	77.3/ 50	77.3/ 50	0 6 91 3	1FFX
		100	62.0/ 50	62.0/ 50	100	77.3/ 50	77.3/ 50		1FFX
									1FFX
									1FFX
1980	BASELINE	0	61.7/ 50	61.7/ 50	0	76.9/ 50	76.9/ 50	0 4 92 4	1FFX
		100	61.7/ 50	61.7/ 50	100	76.9/ 50	76.9/ 50		1FFX
	1	40	62.9/ 50	62.9/ 50	40	77.4/ 50	77.4/ 50		1FFX
		60	61.7/ 50	61.7/ 50	60	76.9/ 50	76.9/ 50		1FFX
	2	40	65.3/ 50	65.3/ 50	40	81.0/ 50	81.0/ 50		
		60	63.7/ 50	63.7/ 50	60	80.3/ 50	80.3/ 50		
	3	75	71.5/ 50	71.5/ 50	75	81.3/ 50	81.3/ 50		
		25	65.3/ 50	65.3/ 50	25	81.0/ 50	81.0/ 50		
1985	BASELINE	0	60.7/ 50	60.7/ 50	0	75.6/ 50	75.6/ 50	0 0 93 7	1FFX
		100	60.7/ 50	60.7/ 50	100	75.6/ 50	75.6/ 50		1FFX
	1	40	62.7/ 50	62.7/ 50	40	76.6/ 50	76.6/ 50		1FFX
		60	60.7/ 50	60.7/ 50	60	75.6/ 50	75.6/ 50		1FFX
	2	40	65.2/ 50	65.2/ 50	40	80.0/ 50	80.0/ 50		
		60	62.5/ 50	62.5/ 50	60	79.0/ 50	79.0/ 50		
	3	75	71.4/ 50	71.4/ 50	75	80.6/ 50	80.6/ 50		
		25	65.2/ 50	65.2/ 50	25	80.0/ 50	80.0/ 50		
	4	75	76.7/ 50	76.7/ 50	75	88.4/ 50	88.4/ 50		
		25	65.5/ 50	69.5/ 50	25	86.8/ 50	86.8/ 50		
	5	75	71.4/ 50	71.4/ 50	75	81.4/ 50	81.4/ 50		
		25	65.2/ 50	65.2/ 50	25	80.0/ 50	80.0/ 50		
1990	BASELINE	0	59.9/ 50	59.9/ 50	0	74.8/ 50	74.8/ 50	0 0 91 9	1FFX
		100	59.9/ 50	59.9/ 50	100	74.8/ 50	74.8/ 50		1FFX
	1	40	62.4/ 50	62.4/ 50	40	76.0/ 50	76.0/ 50		1FFX
		60	59.9/ 50	59.9/ 50	60	74.8/ 50	74.8/ 50		1FFX
	2	40	64.9/ 50	64.9/ 50	40	79.4/ 50	79.4/ 50		
		60	61.7/ 50	61.7/ 50	60	78.1/ 50	78.1/ 50		
	3	75	71.2/ 50	71.2/ 50	75	80.1/ 50	80.1/ 50		
		25	64.9/ 50	64.9/ 50	25	79.4/ 50	79.4/ 50		
	4	75	76.5/ 50	76.5/ 50	75	88.0/ 50	88.0/ 50		
		25	69.2/ 50	69.2/ 50	25	86.0/ 50	86.0/ 50		
	5	75	71.2/ 50	71.2/ 50	75	81.1/ 50	81.1/ 50		
		25	64.9/ 50	64.9/ 50	25	79.4/ 50	79.4/ 50		
1995	BASELINE	0	59.2/ 50	59.2/ 50	0	74.0/ 50	74.0/ 50	0 0 89 11	1FFX
		100	59.2/ 50	59.2/ 50	100	74.0/ 50	74.0/ 50		1FFX
	1	40	62.2/ 50	62.2/ 50	40	75.4/ 50	75.4/ 50		1FFX
		60	59.2/ 50	59.2/ 50	60	74.0/ 50	74.0/ 50		1FFX
	2	40	64.7/ 50	64.7/ 50	40	78.8/ 50	78.8/ 50		
		60	60.8/ 50	60.8/ 50	60	77.2/ 50	77.2/ 50		
	3	75	71.0/ 50	71.0/ 50	75	79.6/ 50	79.6/ 50		
		25	64.7/ 50	64.7/ 50	25	78.8/ 50	78.8/ 50		
	4	75	76.3/ 50	76.3/ 50	75	87.6/ 50	87.6/ 50		
		25	68.9/ 50	68.9/ 50	25	85.3/ 50	85.3/ 50		
	5	75	71.0/ 50	71.0/ 50	75	80.8/ 50	80.8/ 50		
		25	64.7/ 50	64.7/ 50	25	78.8/ 50	78.8/ 50		
2000	BASELINE	0	58.6/ 50	58.6/ 50	0	73.2/ 50	73.2/ 50	0 0 87 13	1FFX
		100	58.6/ 50	58.6/ 50	100	73.2/ 50	73.2/ 50		1FFX
	1	40	61.9/ 50	61.[illegible]/ 50	40	74.9/ 50	74.9/ 50		1FFX
		60	58.6/ 50	58.6/ 50	60	73.2/ 50	73.2/ 50		1FFX
	2	40	64.4/ 50	64.4/ 50	40	78.2/ 50	78.2/ 50		
		60	60.1/ 50	60.1/ 50	60	76.3/ 50	76.3/ 50		
	3	75	70.8/ 50	70.8/ 50	75	79.2/ 50	79.2/ 50		
		25	64.4/ 50	64.4/ 50	25	78.2/ 50	78.2/ 50		
	4	75	76.1/ 50	76.1/ 50	75	87.3/ 50	87.3/ 50		
		25	68.6/ 50	68.6/ 50	25	84.6/ 50	84.6/ 50		
	5	75	70.8/ 50	70.8/ 50	75	80.5/ 50	80.5/ 50		
		25	64.4/ 50	64.4/ 50	25	78.2/ 50	78.2/ 50		

TABLE B-14

J. F. KENNEDY CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	%VAS USE	IFR CAPACITY 15% IFR (OPS/HR)/(% ARRIVALS)		%VAS USE	VFR CAPACITY 85% VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D	RUNWAY CONFIGURATION (IFR LOW / IFR HIGH / VFR LOW / VFR HIGH)
1975									
	BASELINE	0	59.3/ 54	72.2/ 39	0	81.3/ 46	81.3/ 46	0 0 54 46	1DLN
		100	59.3/ 54	72.2/ 39	100	81.3/ 46	81.3/ 46		1ARR1DEP
									1ARR1DEP
									1ARR1DEP
1980									
	BASELINE	0	59.0/ 54	71.9/ 39	0	81.1/ 46	81.1/ 46	0 0 53 47	1DLN
		100	59.0/ 54	71.9/ 39	100	81.1/ 46	81.1/ 46		1ARR1DEP
	1	40	66.0/ 53	84.0/ 37	40	90.3/ 41	90.3/ 41		1ARR1DEP
		60	59.8/ 53	71.9/ 39	60	81.1/ 46	81.1/ 46		1ARR1DEP
	2	40	65.1/ 53	85.1/ 37	40	91.9/ 42	91.9/ 42		
		60	60.7/ 54	72.8/ 39	60	82.7/ 47	82.7/ 47		
	3	75	73.3/ 50	96.7/ 38	75	100.6/ 40	100.6/ 40		
		25	68.3/ 53	85.1/ 37	25	91.9/ 42	91.9/ 42		
1985									
	BASELINE	0	58.4/ 54	71.3/ 39	0	80.4/ 46	80.4/ 46	0 0 50 50	1DLN
		100	58.4/ 54	71.3/ 39	100	80.4/ 46	80.4/ 46		1ARR1DEP
	1	40	66.0/ 53	84.0/ 37	40	90.1/ 41	90.1/ 41		1ARR1DEP
		60	59.4/ 53	71.3/ 39	60	80.4/ 46	80.4/ 46		1ARR1DEP
	2	40	68.1/ 53	85.1/ 37	40	91.6/ 42	91.6/ 42		
		60	60.1/ 54	72.2/ 40	60	81.9/ 47	81.9/ 47		
	3	75	73.3/ 50	96.7/ 38	75	100.5/ 40	100.5/ 40		
		25	68.1/ 53	85.1/ 37	25	91.6/ 42	91.6/ 42		
	4	75	82.1/ 50	104.0/ 42	75	106.5/ 44	106.5/ 44		
		25	71.8/ 53	87.2/ 39	25	94.7/ 44	94.7/ 44		
	5	75	76.0/ 50	100.5/ 40	75	102.7/ 42	102.7/ 42		
		25	68.1/ 53	85.1/ 37	25	91.6/ 42	91.6/ 42		
1990									
	BASELINE	0	57.4/ 55	70.2/ 39	0	79.1/ 46	79.1/ 46	0 0 44 56	1DLN
		100	57.4/ 55	70.2/ 39	100	79.1/ 46	79.1/ 46		1ARR1DEP
	1	40	66.3/ 53	84.3/ 37	40	39.8/ 41	89.8/ 41		1ARR1DEP
		60	58.9/ 53	70.2/ 39	60	79.1/ 46	79.1/ 46		1ARR1DEP
	2	40	68.3/ 53	85.4/ 37	40	91.4/ 42	91.4/ 42		
		60	59.0/ 55	71.1/ 40	60	80.7/ 47	80.7/ 47		
	3	75	73.3/ 50	96.7/ 38	75	100.4/ 40	100.4/ 40		
		25	68.3/ 53	85.4/ 37	25	91.4/ 42	91.4/ 42		
	4	75	82.4/ 50	103.9/ 42	75	106.5/ 44	106.5/ 44		
		25	72.1/ 53	87.5/ 39	25	94.4/ 43	94.4/ 43		
	5	75	76.3/ 50	100.4/ 40	75	102.7/ 42	102.7/ 42		
		25	68.3/ 53	85.4/ 37	25	91.4/ 42	91.4/ 42		
1995									
	BASELINE	0	57.0/ 55	69.9/ 39	0	78.8/ 46	78.8/ 46	0 0 42 58	1DLN
		100	57.0/ 55	69.9/ 39	100	78.8/ 46	78.8/ 46		1ARR1DEP
	1	40	66.3/ 53	84.4/ 37	40	89.8/ 40	89.8/ 40		1ARR1DEP
		60	58.8/ 53	69.9/ 39	60	78.8/ 46	78.8/ 46		1ARR1DEP
	2	40	68.6/ 53	85.5/ 37	40	91.3/ 41	91.3/ 41		
		60	58.7/ 55	70.8/ 40	60	80.3/ 47	80.3/ 47		
	3	75	73.4/ 50	96.7/ 38	75	100.4/ 40	100.4/ 40		
		25	68.6/ 53	85.5/ 37	25	91.3/ 41	91.3/ 41		
	4	75	82.5/ 50	103.9/ 42	75	106.6/ 44	106.6/ 44		
		25	72.3/ 53	87.6/ 39	25	94.3/ 43	94.3/ 43		
	5	75	76.4/ 50	100.4/ 40	75	102.7/ 42	102.7/ 42		
		25	68.6/ 53	85.5/ 37	25	91.3/ 41	91.3/ 41		
2000									
	BASELINE	0	55.8/ 56	68.8/ 40	0	77.6/ 46	77.6/ 46	0 0 34 66	1DLN
		100	55.8/56	68.8/ 40	100	77.6/ 46	77.6/ 46		1ARR1DEP
	1	40	67.4/ 53	85.1/ 37	40	90.0/ 40	90.0/ 40		1ARR1DEP
		60	58.7/ 53	68.8/ 40	60	77.6/ 46	77.6/ 46		1ARR1DEP
	2	40	67.8/ 54	86.2/ 37	40	91.5/ 41	91.5/ 41		
		60	57.3/ 56	69.6/ 40	60	79.1/ 47	79.1/ 47		
	3	75	73.5/ 50	96.8/ 38	75	100.4/ 40	100.4/ 40		
		25	69.5/ 53	86.2/ 37	25	91.5/ 41	91.5/ 41		
	4	75	83.2/ 50	104.0/ 42	75	106.7/ 44	106.7/ 44		
		25	73.4/ 53	88.4/ 39	25	94.4/ 43	94.4/ 43		
	5	75	77.3/ 50	100.5/ 40	75	102.9/ 42	102.9/ 42		
		25	69.5/ 53	86.2/ 37	25	91.5/ 41	91.5/ 41		

TABLE B-15

LAS VEGAS CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	WVAS USE	IFR CAPACITY 2% IFR (OPS/HR)/(% ARRIVALS)		WVAS USE	VFR CAPACITY 98% VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D	RUNWAY CONFIGURATION IFR LOW / IFR HIGH / VFR LOW / VFR HIGH
1975	BASELINE	0	80.9/ 37	80.9/ 37	0	91.2/ 44	91.2/ 44	0 0 81 19	1ARR1DEP
		100	80.9/ 37	80.9/ 37	100	91.2/ 44	91.2/ 44		1ARR1DEP
									1ARR1DEP
									1ARR1DEP
1980	BASELINE	0	80.5/ 37	80.5/ 37	0	90.7/ 44	90.7/ 44	0 0 80 20	1ARR1DEP
		100	80.5/ 37	80.5/ 37	100	90.7/ 44	90.7/ 44		1ARR1DEP
	1	40	86.5/ 36	86.5/ 36	40	95.4/ 42	95.4/ 42		1ARR1DEP
		60	80.5/ 37	80.5/ 37	60	90.7/ 44	90.7/ 44		1ARR1DEP
	2	40	87.6/ 37	87.6/ 37	40	97.3/ 43	97.3/ 43		
		60	81.5/ 38	81.5/ 38	60	92.6/ 45	92.6/ 45		
	3	75	97.1/ 38	97.1/ 38	75	102.7/ 42	102.7/ 42		
		25	87.6/ 37	87.6/ 37	25	97.3/ 43	97.3/ 43		
1985	BASELINE	0	79.6/ 37	79.6/ 37	0	89.7/ 44	89.7/ 44	0 0 78 22	1ARR1DEP
		100	79.6/ 37	79.6/ 37	100	89.7/ 44	89.7/ 44		1ARR1DEP
	1	40	86.1/ 36	86.1/ 36	40	94.8/ 42	94.8/ 42		1ARR1DEP
		60	79.6/ 37	79.6/ 37	60	89.7/ 44	89.7/ 44		1ARR1DEP
	2	40	87.3/ 37	87.3/ 37	40	96.7/ 43	96.7/ 43		
		60	80.6/ 38	80.6/ 38	60	91.6/ 45	91.6/ 45		
	3	75	97.1/ 38	97.1/ 38	75	102.5/ 41	102.5/ 41		
		25	87.3/ 37	87.3/ 37	25	96.7/ 43	96.7/ 43		
	4	75	105.6/ 43	105.6/ 43	75	107.8/ 44	107.8/ 44		
		25	89.4/ 38	89.4/ 38	25	100.3/ 45	100.3/ 45		
	5	75	101.9/ 41	101.9/ 41	75	103.8/ 42	103.8/ 42		
		25	87.3/ 37	87.3/ 37	25	96.7/ 43	96.7/ 43		
1990	BASELINE	0	78.4/ 37	78.4/ 37	0	88.4/ 44	88.4/ 44	0 0 75 25	1ARR1DEP
		100	78.4/ 37	78.4/ 37	100	88.4/ 44	88.4/ 44		1ARR1DEP
	1	40	85.7/ 36	85.7/ 36	40	94.0/ 42	94.0/ 42		1ARR1DEP
		60	78.4/ 37	78.4/ 37	60	88.4/ 44	88.4/ 44		1ARR1DEP
	2	40	86.8/ 37	86.8/ 37	40	95.8/ 43	95.8/ 43		
		60	79.4/ 38	79.4/ 38	60	90.2/ 45	90.2/ 45		
	3	75	97.0/ 38	97.0/ 38	75	102.2/ 41	102.2/ 41		
		25	86.8/ 37	86.8/ 37	25	95.8/ 43	95.8/ 43		
	4	75	105.3/ 43	105.3/ 43	75	107.6/ 44	107.6/ 44		
		25	88.9/ 38	88.9/ 38	25	99.3/ 45	99.3/ 45		
	5	75	101.6/ 41	101.6/ 41	75	103.6/ 42	103.6/ 42		
		25	86.8/ 37	86.8/ 37	25	95.8/ 43	95.8/ 43		
1995	BASELINE	0	76.3/ 38	76.3/ 38	0	85.9/ 45	85.9/ 45	0 0 69 31	1ARR1DEP
		100	76.3/ 38	76.3/ 38	100	85.9/ 45	85.9/ 45		1ARR1DEP
	1	40	84.9/ 36	84.9/ 36	40	92.6/ 41	92.6/ 41		1ARR1DEP
		60	76.3/ 38	76.3/ 38	60	85.9/ 45	85.9/ 45		1ARR1DEP
	2	40	86.0/ 37	86.0/ 37	40	94.3/ 43	94.3/ 43		
		60	77.3/ 38	77.3/ 38	60	87.7/ 46	87.7/ 46		
	3	75	96.9/ 38	96.9/ 38	75	101.6/ 41	101.6/ 41		
		25	86.0/ 37	86.0/ 37	25	94.3/ 43	94.3/ 43		
	4	75	104.8/ 43	104.8/ 43	75	107.2/ 44	107.2/ 44		
		25	88.1/ 38	88.1/ 38	25	97.7/ 45	97.7/ 45		
	5	75	101.2/ 41	101.2/ 41	75	103.2/ 42	103.2/ 42		
		25	86.0/ 37	86.0/ 37	25	94.3/ 43	94.3/ 43		
2000	BASELINE	0	74.4/ 38	74.4/ 38	0	83.9/ 45	83.9/ 45	0 0 63 37	1ARR1DEP
		100	74.4/ 38	74.4/ 38	100	83.9/ 45	83.9/ 45		1ARR1DEP
	1	40	84.4/ 36	84.4/ 36	40	91.5/ 41	91.5/ 41		1ARR1DEP
		60	74.4/ 38	74.4/ 38	60	83.9/ 45	83.9/ 45		1ARR1DEP
	2	40	85.5/ 37	85.5/ 37	40	93.2/ 42	93.2/ 42		
		60	75.4/ 39	75.4/ 39	60	85.5/ 46	85.5/ 46		
	3	75	96.8/ 38	96.8/ 38	75	101.2/ 41	101.2/ 41		
		25	85.5/ 37	85.5/ 37	25	93.2/ 42	93.2/ 42		
	4	75	104.4/ 43	104.4/ 43	75	106.9/ 44	106.9/ 44		
		25	87.6/ 39	87.6/ 39	25	96.4/ 44	96.4/ 44		
	5	75	100.9/ 41	100.9/ 41	75	103.0/ 42	103.0/ 42		
		25	85.5/ 37	85.5/ 37	25	93.2/ 42	93.2/ 42		

TABLE B-16

LOS ANGELES CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	%VAS USE	IFR CAPACITY 25% IFR (OPS/HR)/(% ARRIVALS)		%VAS USE	VFR CAPACITY 75% VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D	RUNWAY CONFIGURATION (IFR LOW / IFR HIGH / VFR LOW / VFR HIGH)
1975	BASELINE	0	106.6/ 50	106.6/ 50	0	167.0/ 45	167.0/ 45	0 1 61 38	2CLN
		100	106.6/ 50	106.6/ 50	100	167.0/ 45	167.0/ 45		2DLN
									2ARR2DEP
									2ARR2DEP
1980	BASELINE	0	106.5/ 50	106.5/ 50	0	166.5/ 45	166.5/ 45	0 0 61 39	2CLN
		100	106.5/ 50	106.5/ 50	100	166.5/ 45	166.5/ 45		2DLN
	1	40	120.9/ 50	120.8/ 50	40	182.4/ 41	182.4/ 41		2ARR2DEP
		60	106.5/ 50	106.5/ 50	60	166.5/ 45	166.5/ 45		2ARR2DEP
	2	40	125.9/ 50	125.9/ 50	40	185.7/ 42	185.7/ 42		
		60	108.8/ 50	108.8/ 50	60	165.8/ 46	169.8/ 46		
	3	75	146.9/ 50	146.9/ 50	75	202.0/ 41	202.0/ 41		
		25	125.9/ 50	125.9/ 50	25	185.7/ 42	185.7/ 42		
1985	BASELINE	0	105.6/ 50	105.6/ 50	0	164.2/ 45	164.2/ 45	0 0 57 43	2DLN
		100	105.6/ 50	105.6/ 50	100	164.2/ 45	164.2/ 45		2DLN
	1	40	120.8/ 50	120.8/ 50	40	181.3/ 41	181.3/ 41		2ARR2DEP
		60	105.6/ 50	105.6/ 50	60	164.2/ 45	164.2/ 45		2ARR2DEP
	2	40	125.9/ 50	125.9/ 50	40	184.6/ 42	184.6/ 42		
		60	108.0/ 50	108.0/ 50	60	167.4/ 46	167.4/ 46		
	3	75	146.8/ 50	146.8/ 50	75	201.6/ 40	201.6/ 40		
		25	125.9/ 50	125.9/ 50	25	184.6/ 42	184.6/ 42		
	4	75	164.0/ 50	164.0/ 50	75	213.3/ 44	213.3/ 44		
		25	133.0/ 50	133.0/ 50	25	191.0/ 44	191.0/ 44		
	5	75	151.8/ 50	151.8/ 50	75	205.6/ 42	205.6/ 42		
		25	125.9/ 50	125.9/ 50	25	184.6/ 42	184.6/ 42		
1990	BASELINE	0	104.7/ 50	104.7/ 50	0	161.6/ 46	161.6/ 46	0 0 52 48	2DLN
		100	104.7/ 50	104.7/ 50	100	161.6/ 46	161.6/ 46		2DLN
	1	40	120.9/ 50	120.9/ 50	40	180.4/ 41	180.4/ 41		2ARR2DEP
		60	104.7/ 50	104.7/ 50	60	161.6/ 46	161.6/ 46		2ARR2DEP
	2	40	126.0/ 50	126.0/ 50	40	183.6/ 42	183.6/ 42		
		60	107.2/ 50	107.2/ 50	60	164.8/ 47	164.8/ 47		
	3	75	146.7/ 50	146.7/ 50	75	201.2/ 40	201.2/ 40		
		25	126.0/ 50	126.0/ 50	25	183.6/ 42	183.6/ 42		
	4	75	164.2/ 50	164.2/ 50	75	213.1/ 44	213.1/ 44		
		25	133.0/ 50	133.0/ 50	25	189.8/ 44	189.8/ 44		
	5	75	152.0/ 50	152.0/ 50	75	205.4/ 42	205.4/ 42		
		25	126.0/ 50	126.0/ 50	25	183.6/ 42	183.6/ 42		
1995	BASELINE	0	104.0/ 50	104.0/ 50	0	159.4/ 46	159.4/ 46	0 0 47 53	2DLN
		100	104.0/ 50	104.0/ 50	100	159.4/ 46	159.4/ 46		2DLN
	1	40	121.1/ 50	121.1/ 50	40	179.8/ 41	179.8/ 41		2ARR2DEP
		60	104.0/ 50	104.0/ 50	60	159.4/ 46	159.4/ 46		2ARR2DEP
	2	40	126.2/ 50	126.2/ 50	40	182.9/ 42	182.9/ 42		
		60	106.7/ 50	106.7/ 50	60	162.6/ 47	162.6/ 47		
	3	75	146.7/ 50	146.7/ 50	75	200.9/ 40	200.9/ 40		
		25	126.2/ 50	126.2/ 50	25	182.9/ 42	182.9/ 42		
	4	75	164.5/ 50	164.5/ 50	75	213.1/ 44	213.1/ 44		
		25	133.3/ 50	133.3/ 50	25	189.0/ 44	189.0/ 44		
	5	75	152.3/ 50	152.3/ 50	75	205.4/ 42	205.4/ 42		
		25	126.2/ 50	126.2/ 50	25	182.9/ 42	182.9/ 42		
2000	BASELINE	0	103.5/ 50	103.5/ 50	0	157.2/ 46	157.2/ 46	0 0 41 59	2DLN
		100	103.5/ 50	103.5/ 50	100	157.2/ 46	157.2/ 46		2DLN
	1	40	121.7/ 50	121.7/ 50	40	179.5/ 40	179.5/ 40		2ARR2DEP
		60	103.5/ 50	103.5/ 50	60	157.2/ 46	157.2/ 46		2ARR2DEP
	2	40	126.8/ 50	126.8/ 50	40	182.6/ 41	182.6/ 41		
		60	106.4/ 50	106.4/ 50	60	160.3/ 47	160.3/ 47		
	3	75	146.8/ 50	146.8/ 50	75	200.7/ 40	200.7/ 40		
		25	126.8/ 50	126.8/ 50	25	182.6/ 41	182.6/ 41		
	4	75	165.2/ 50	165.2/ 50	75	213.2/ 44	213.2/ 44		
		25	133.9/ 50	133.9/ 50	25	188.6/ 43	188.6/ 43		
	5	75	152.9/ 50	152.9/ 50	75	205.4/ 42	205.4/ 42		
		25	126.8/ 50	126.8/ 50	25	182.6/ 41	182.6/ 41		

TABLE B-17

LAGUARDIA CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	WVAS USE	IFR CAPACITY 15% IFR (OPS/HR)/(% ARRIVALS)		WVAS USE	VFR CAPACITY 85% VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D	RUNWAY CONFIGURATION IFR LOW IFR HIGH VFR LOW VFR HIGH
1975	BASELINE	0	59.3/ 50	61.5/ 50	0	73.1/ 50	78.0/ 50	0 8 88 4	1NFX
		100	59.3/ 50	61.5/ 50	100	73.1/ 50	78.0/ 50		1FNX
									1NFX
									1FFX
1980	BASELINE	0	57.9/ 50	59.8/ 50	0	71.3/ 50	75.8/ 50	0 2 89 9	1NFX
		100	57.9/ 50	59.8/ 50	100	71.3/ 50	75.8/ 50		1FNX
	1	40	59.7/ 50	62.3/ 50	40	72.3/ 50	77.1/ 50		1NFX
		60	57.9/ 50	59.8/ 50	60	71.3/ 50	75.8/ 50		1FFX
	2	40	62.0/ 50	64.8/ 50	40	75.4/ 50	80.6/ 50		
		60	59.5/ 50	61.6/ 50	60	74.3/ 50	79.2/ 50		
	3	75	62.0/ 50	74.0/ 50	75	75.8/ 50	81.5/ 50		
		25	62.0/ 50	64.8/ 50	25	75.4/ 50	80.6/ 50		
1985	BASELINE	0	56.5/ 50	58.3/ 50	0	69.7/ 50	73.8/ 50	0 0 86 14	1NFX
		100	56.5/ 50	58.3/ 50	100	69.7/ 50	73.8/ 50		1FNX
	1	40	59.1/ 50	61.9/ 50	40	71.1/ 50	75.6/ 50		1NFX
		60	56.5/ 50	58.3/ 50	60	69.7/ 50	73.8/ 50		1FFX
	2	40	61.3/ 50	64.4/ 50	40	74.1/ 50	79.2/ 50		
		60	57.9/ 50	59.8/ 50	60	72.5/ 50	77.1/ 50		
	3	75	61.4/ 50	73.8/ 50	75	74.6/ 50	80.4/ 50		
		25	61.3/ 50	64.4/ 50	25	74.1/ 50	79.2/ 50		
	4	75	65.3/ 50	79.6/ 50	75	80.5/ 50	86.9/ 50		
		25	65.2/ 50	68.5/ 50	25	79.8/ 50	85.8/ 50		
	5	75	61.4/ 50	73.9/ 50	75	74.6/ 50	81.9/ 50		
		25	61.3/ 50	64.4/ 50	25	74.1/ 50	79.2/ 50		
1990	BASELINE	0	55.3/ 50	56.9/ 50	0	68.2/ 50	72.0/ 50	0 0 81 19	1NFX
		100	55.3/ 50	56.9/ 50	100	68.2/ 50	72.0/ 50		1FNX
	1	40	59.4/ 50	61.4/ 50	40	69.9/ 50	74.6/ 50		1NFX
		60	55.3/ 50	56.9/ 50	60	68.2/ 50	72.0/ 50		1FFX
	2	40	60.6/ 50	63.9/ 50	40	72.8/ 50	77.8/ 50		
		60	56.5/ 50	58.2/ 50	60	70.9/ 50	75.0/ 50		
	3	75	60.7/ 50	73.5/ 50	75	73.5/ 50	79.5/ 50		
		25	60.6/ 50	63.9/ 50	25	72.8/ 50	77.8/ 50		
	4	75	64.5/ 50	79.3/ 50	75	79.1/ 50	86.2/ 50		
		25	64.4/ 50	67.9/ 50	25	78.4/ 50	84.2/ 50		
	5	75	60.7/ 50	73.6/ 50	75	73.5/ 50	81.3/ 50		
		25	60.6/ 50	63.9/ 50	25	72.6/ 50	77.8/ 50		
1995	BASELINE	0	54.6/ 50	56.1/ 50	0	67.3/ 50	71.0/ 50	0 0 78 22	1NFX
		100	54.6/ 50	56.1/ 50	100	67.3/ 50	71.0/ 50		1FNX
	1	40	58.0/ 50	61.2/ 50	40	69.3/ 50	73.9/ 50		1NFX
		60	54.6/ 50	56.1/ 50	60	67.3/ 50	71.0/ 50		1FFX
	2	40	60.2/ 50	63.7/ 50	40	72.1/ 50	77.1/ 50		
		60	55.8/ 50	57.4/ 50	60	70.0/ 50	73.9/ 50		
	3	75	60.3/ 50	73.4/ 50	75	72.8/ 50	79.0/ 50		
		25	60.2/ 50	63.7/ 50	25	72.1/ 50	77.1/ 50		
	4	75	64.1/ 50	79.1/ 50	75	78.4/ 50	87.9/ 50		
		25	63.9/ 50	67.6/ 50	25	77.5/ 50	83.4/ 50		
	5	75	60.3/ 50	73.5/ 50	75	72.8/ 50	80.9/ 50		
		25	60.2/ 50	63.7/ 50	25	72.1/ 50	77.1/ 50		
2000	BASELINE	0	53.9/ 50	55.3/ 50	0	66.3/ 50	69.7/ 50	0 0 74 26	1NFX
		100	53.9/ 50	55.3/ 50	100	66.3/ 50	69.7/ 50		1FNX
	1	40	57.5/ 50	60.9/ 50	40	68.4/ 50	73.1/ 50		1NFX
		60	53.9/ 50	55.3/ 50	60	66.3/ 50	69.7/ 50		1FFX
	2	40	59.7/ 50	63.4/ 50	40	71.1/ 50	76.2/ 50		
		60	55.0/ 50	56.5/ 50	60	68.9/ 50	72.6/ 50		
	3	75	59.8/ 50	73.2/ 50	75	71.9/ 50	78.4/ 50		
		25	59.7/ 50	63.4/ 50	25	71.1/ 50	76.2/ 50		
	4	75	63.5/ 50	79.0/ 50	75	77.3/ 50	87.4/ 50		
		25	63.3/ 50	67.3/ 50	25	76.4/ 50	82.3/ 50		
	5	75	59.8/ 50	73.3/ 50	75	71.9/ 50	80.6/ 50		
		25	59.7/ 50	63.4/ 50	25	71.1/ 50	76.2/ 50		

TABLE B-18

KANSAS CITY CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	%WVAS USE	IFR CAPACITY 10% IFR (OPS/HR)/(% ARRIVALS)		%WVAS USE	VFR CAPACITY 90% VFR (OPS/HR)/(% ARRIVALS)		MIX A	B	C	D	RUNWAY CONFIGURATION IFR LOW / IFR HIGH / VFR LOW / VFR HIGH
1975	BASELINE	0	88.6/ 35	88.6/ 35	0	99.6/ 42	102.9/ 70	0	19	77	4	1ARR1DEP
		100	88.6/ 35	88.6/ 35	100	99.6/ 42	102.9/ 70					1ARR1DEP
												1ARR1DEP
												1ARR1A/D
1980	BASELINE	0	88.2/ 35	88.2/ 35	0	99.3/ 42	102.6/ 71	0	9	86	5	1ARR1DEP
		100	88.2/ 35	88.2/ 35	100	99.3/ 42	102.6/ 71					1ARR1DEP
	1	40	89.9/ 35	89.9/ 35	40	100.7/ 42	103.0/ 70					1ARR1DEP
		60	88.2/ 35	88.2/ 35	60	99.3/ 42	102.6/ 71					1ARR1A/D
	2	40	91.1/ 36	91.1/ 36	40	102.8/ 43	107.2/ 71					
		60	89.3/ 36	89.3/ 36	60	101.4/ 44	106.8/ 71					
	3	75	97.3/ 38	97.3/ 38	75	104.5/ 43	107.8/ 71					
		25	91.1/ 36	91.1/ 36	25	102.8/ 43	107.2/ 71					
1985	BASELINE	0	87.8/ 35	87.8/ 35	0	99.1/ 43	102.3/ 71	0	0	94	6	1ARR1DEP
		100	87.8/ 35	87.8/ 35	100	99.1/ 43	102.3/ 71					1ARR1DEP
	1	40	89.9/ 35	89.9/ 35	40	100.7/ 42	102.8/ 71					1ARR1DEP
		60	87.8/ 35	87.8/ 35	60	99.1/ 43	102.3/ 71					1ARR1A/D
	2	40	91.1/ 36	91.1/ 36	40	102.9/ 43	107.1/ 71					
		60	89.0/ 36	89.0/ 36	60	101.2/ 44	106.6/ 71					
	3	75	97.7/ 39	97.7/ 39	75	104.8/ 43	107.8/ 71					
		25	91.1/ 36	91.1/ 36	25	102.9/ 43	107.1/ 71					
	4	75	107.6/ 44	107.6/ 44	75	109.6/ 45	116.6/ 71					
		25	93.3/ 37	93.3/ 37	25	107.1/ 45	115.4/ 71					
	5	75	103.6/ 42	103.6/ 42	75	105.3/ 43	108.2/ 71					
		25	91.1/ 36	91.1/ 36	25	102.9/ 43	107.1/ 71					
1990	BASELINE	0	86.0/ 36	86.0/ 36	0	97.0/ 43	101.3/ 71	0	0	91	9	1ARR1DEP
		100	86.0/ 36	86.0/ 36	100	97.0/ 43	101.3/ 71					1ARR1DEP
	1	40	89.0/ 35	89.0/ 35	40	99.4/ 42	102.0/ 70					1ARR1DEP
		60	86.0/ 36	86.0/ 36	60	97.0/ 43	101.3/ 71					1ARR1A/D
	2	40	90.2/ 36	90.2/ 36	40	101.5/ 43	106.2/ 71					
		60	87.1/ 37	87.1/ 37	60	99.1/ 44	105.4/ 71					
	3	75	97.5/ 38	97.5/ 38	75	104.3/ 42	107.2/ 71					
		25	90.2/ 36	90.2/ 36	25	101.5/ 43	106.2/ 71					
	4	75	107.2/ 44	107.2/ 44	75	109.2/ 45	116.2/ 71					
		25	92.4/ 38	92.4/ 38	25	105.5/ 45	114.3/ 71					
	5	75	103.2/ 42	103.2/ 42	75	104.9/ 43	107.8/ 71					
		25	90.2/ 36	90.2/ 36	25	101.5/ 43	106.2/ 71					
1995	BASELINE	0	84.9/ 36	84.9/ 36	0	95.7/ 43	100.7/ 71	0	0	89	11	1ARR1DEP
		100	84.9/ 36	84.9/ 36	100	95.7/ 43	100.7/ 71					1ARR1DEP
	1	40	88.5/ 35	88.5/ 35	40	98.6/ 42	101.5/ 70					1ARR1DEP
		60	84.9/ 36	84.9/ 36	60	95.7/ 43	100.7/ 71					1ARR1A/D
	2	40	89.6/ 36	89.6/ 36	40	100.6/ 43	105.7/ 71					
		60	86.0/ 37	86.0/ 37	60	97.7/ 44	104.8/ 71					
	3	75	97.5/ 38	97.5/ 38	75	104.0/ 42	106.8/ 71					
		25	89.6/ 36	89.6/ 36	25	100.6/ 43	105.7/ 71					
	4	75	106.9/ 44	106.9/ 44	75	109.0/ 45	115.9/ 71					
		25	91.8/ 38	91.8/ 38	25	104.6/ 45	113.7/ 71					
	5	75	103.0/ 42	103.0/ 42	75	104.7/ 43	107.6/ 71					
		25	89.6/ 36	89.6/ 36	25	100.6/ 43	105.7/ 71					
2000	BASELINE	0	83.3/ 36	83.3/ 36	0	93.9/ 43	99.8/ 70	0	0	86	14	1ARR1DEP
		100	83.3/ 36	83.3/ 36	100	93.9/ 43	99.8/ 70					1ARR1DEP
	1	40	87.8/ 36	87.8/ 36	40	97.4/ 42	100.8/ 70					1ARR1DEP
		60	83.3/ 36	83.3/ 36	60	93.9/ 43	99.8/ 70					1ARR1A/D
	2	40	88.9/ 36	88.9/ 36	40	99.4/ 43	104.9/ 70					
		60	84.4/ 37	84.4/ 37	60	95.9/ 45	103.8/ 71					
	3	75	97.3/ 38	97.3/ 38	75	103.5/ 42	106.3/ 70					
		25	88.9/ 36	88.9/ 36	25	99.4/ 43	104.9/ 70					
	4	75	106.5/ 44	106.5/ 44	75	108.6/ 45	115.5/ 71					
		25	91.1/ 38	91.1/ 38	25	103.3/ 45	112.7/ 71					
	5	75	102.6/ 42	102.6/ 42	75	104.4/ 43	107.2/ 71					
		25	88.9/ 36	88.9/ 36	25	99.4/ 43	104.9/ 70					

TABLE B-19

MEMPHIS CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	%VAS USE	IFR CAPACITY 95% IFR (OPS/HR)/(% ARRIVALS)		%VAS USE	VFR CAPACITY 91% VFR (OPS/HR)/(% ARRIVALS)		MIA A B C D	RUNWAY CONFIGURATION	IFR LOW IFR HIGH VFR LOW VFR HIGH
1975	BASELINE	0	92.5/ 33	92.5/ 33	0	121.9/ 50	161.5/ 45	0 13 84 3	10LV	
		100	92.5/ 33	92.5/ 33	100	121.9/ 50	161.5/ 45		10LV	
									2A/D	
									1ARR1DEP1A/D	
1980	BASELINE	0	92.5/ 33	92.5/ 33	0	120.8/ 50	160.7/ 45	0 4 92 4	10L.	
		100	92.5/ 33	92.5/ 33	100	120.8/ 50	160.7/ 45		10LV	
	1	40	94.4/ 33	94.4/ 33	40	121.5/ 50	162.2/ 45		2A/D	
		60	92.5/ 33	92.5/ 33	60	120.8/ 50	160.7/ 45		1ARR1DEP1A/D	
	2	40	98.0/ 33	98.0/ 33	40	125.8/ 50	166.5/ 46			
		60	95.6/ 33	95.6/ 33	60	125.1/ 50	165.0/ 46			
	3	75	112.7/ 33	112.7/ 33	75	126.2/ 50	166.1/ 46			
		25	98.0/ 33	98.0/ 33	25	125.8/ 50	166.5/ 46			
1985	BASELINE	0	91.0/ 33	91.0/ 33	0	119.6/ 50	158.2/ 46	0 0 93 7	10LV	
		100	91.0/ 33	91.0/ 33	100	119.6/ 50	158.2/ 46		10LV	
	1	40	94.1/ 33	94.1/ 33	40	120.8/ 50	160.7/ 45		2A/D	
		60	91.0/ 33	91.0/ 33	60	119.6/ 50	158.2/ 46		1ARR1DEP1A/D	
	2	40	97.8/ 33	97.8/ 33	40	125.1/ 50	164.4/ 46			
		60	93.8/ 33	93.8/ 33	60	123.8/ 50	162.4/ 46			
	3	75	112.8/ 33	112.8/ 33	75	125.8/ 50	167.6/ 45			
		25	97.8/ 33	97.8/ 33	25	125.1/ 50	164.9/ 46			
	4	75	126.7/ 33	126.7/ 33	75	134.0/ 50	176.5/ 47			
		25	104.3/ 33	104.3/ 33	25	133.1/ 50	173.1/ 47			
	5	75	117.0/ 33	117.0/ 33	75	125.8/ 50	166.1/ 46			
		25	97.8/ 33	97.8/ 33	25	125.1/ 50	164.9/ 46			
1990	BASELINE	0	89.9/ 33	89.9/ 33	0	119.1/ 50	156.6/ 46	0 0 91 9	10LV	
		100	89.9/ 33	89.9/ 33	100	119.1/ 50	156.6/ 46		10LV	
	1	40	93.7/ 33	93.7/ 33	40	120.5/ 50	159.7/ 45		2A/D	
		60	89.9/ 33	89.9/ 33	60	119.1/ 50	156.6/ 46		1ARR1DEP1A/D	
	2	40	97.4/ 33	97.4/ 33	40	124.8/ 50	163.9/ 46			
		60	92.5/ 33	92.5/ 33	60	123.3/ 50	160.7/ 46			
	3	75	112.5/ 33	112.5/ 33	75	125.7/ 50	167.2/ 45			
		25	97.4/ 33	97.4/ 33	25	124.8/ 50	163.9/ 46			
	4	75	126.3/ 33	126.3/ 33	75	133.9/ 50	176.2/ 47			
		25	103.8/ 33	103.8/ 33	25	132.8/ 50	172.0/ 47			
	5	75	116.6/ 33	116.6/ 33	75	125.8/ 50	167.8/ 46			
		25	97.4/ 33	97.4/ 33	25	124.8/ 50	163.9/ 46			
1995	BASELINE	0	88.9/ 33	88.9/ 33	0	118.6/ 50	155.0/ 46	0 0 89 11	10LV	
		100	88.9/ 33	88.9/ 33	100	118.6/ 50	155.0/ 46		10LV	
	1	40	93.3/ 33	93.3/ 33	40	120.3/ 50	156.7/ 45		2A/D	
		60	88.9/ 33	88.9/ 33	60	118.6/ 50	155.0/ 46		1ARR1DEP1A/D	
	2	40	97.1/ 33	97.1/ 33	40	124.5/ 50	162.9/ 46			
		60	91.3/ 33	91.3/ 33	60	122.7/ 50	159.1/ 47			
	3	75	112.3/ 33	112.3/ 33	75	125.6/ 50	166.8/ 45			
		25	97.1/ 33	97.1/ 33	25	124.5/ 50	162.9/ 46			
	4	75	125.9/ 33	125.9/ 33	75	133.9/ 50	175.9/ 47			
		25	103.4/ 33	103.4/ 33	25	132.6/ 50	170.9/ 47			
	5	75	116.3/ 33	116.3/ 33	75	125.7/ 50	167.6/ 45			
		25	97.1/ 33	97.1/ 33	25	124.5/ 50	162.9/ 46			
2000	BASELINE	0	87.9/ 33	87.9/ 33	0	118.1/ 50	153.6/ 46	0 0 87 13	10LV	
		100	87.9/ 33	87.9/ 33	100	118.1/ 50	153.6/ 46		10LV	
	1	40	93.0/ 33	93.0/ 33	40	120.1/ 50	157.8/ 45		2A/D	
		60	87.9/ 33	87.9/ 33	60	118.1/ 50	153.6/ 46		1ARR1DEP1A/D	
	2	40	96.8/ 33	96.8/ 33	40	124.3/ 50	161.9/ 46			
		60	90.2/ 33	90.2/ 33	60	122.2/ 50	157.6/ 47			
	3	75	112.1/ 33	112.1/ 33	75	125.6/ 50	166.5/ 45			
		25	96.8/ 33	96.8/ 33	25	124.3/ 50	161.9/ 46			
	4	75	125.5/ 33	125.5/ 33	75	133.8/ 50	175.6/ 47			
		25	103.0/ 33	103.0/ 33	25	132.3/ 50	169.8/ 47			
	5	75	116.0/ 33	116.0/ 33	75	125.6/ 50	167.3/ 45			
		25	96.8/ 33	96.8/ 33	25	124.3/ 50	161.9/ 46			

TABLE B-20

MIAMI CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	%AVAS USE	IFR CAPACITY 14% IFR (OPS/HR)/(% ARRIVALS)		%AVAS USE	VFR CAPACITY 59% VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D	RUNWAY CONFIGURATION IFR LOW IFR HIGH VFR LOW VFR HIGH
1975	BASELINE	0	101.4/ 50	101.4/ 50	0	115.8/ 50	115.8/ 50	0 4 69 27	2A/D
		100	101.4/ 50	101.4/ 50	100	115.8/ 50	115.8/ 50		2A/D
									2A/D
									2A/D
1980	BASELINE	0	100.8/ 50	100.8/ 50	0	115.1/ 50	115.1/ 50	0 2 67 31	2A/D
		100	100.8/ 50	100.8/ 50	100	115.1/ 50	115.1/ 50		2A/D
	1	40	106.9/ 50	106.9/ 50	40	118.6/ 50	118.6/ 50		2A/D
		60	100.8/ 50	100.8/ 50	60	115.1/ 50	115.1/ 50		2A/D
	2	40	110.3/ 50	110.3/ 50	40	122.7/ 50	122.7/ 50		
		60	104.0/ 50	104.0/ 50	60	118.9/ 50	118.9/ 50		
	3	75	111.4/ 50	111.4/ 50	75	125.0/ 50	125.0/ 50		
		25	110.3/ 50	110.3/ 50	25	122.7/ 50	122.7/ 50		
1985	BASELINE	0	100.5/ 50	100.5/ 50	0	114.6/ 50	114.6/ 50	0 0 66 34	2A/D
		100	100.5/ 50	100.5/ 50	100	114.6/ 50	114.6/ 50		2A/D
	1	40	106.9/ 50	106.9/ 50	40	118.3/ 50	118.3/ 50		2A/D
		60	100.5/ 50	100.5/ 50	60	114.6/ 50	114.6/ 50		2A/D
	2	40	110.3/ 50	110.3/ 50	40	122.4/ 50	122.4/ 50		
		60	103.7/ 50	103.7/ 50	60	118.4/ 50	118.4/ 50		
	3	75	111.4/ 50	111.4/ 50	75	124.8/ 50	124.8/ 50		
		25	110.3/ 50	110.3/ 50	25	122.4/ 50	122.4/ 50		
	4	75	117.7/ 50	117.7/ 50	75	133.0/ 50	133.0/ 50		
		25	116.5/ 50	116.5/ 50	25	130.1/ 50	130.1/ 50		
	5	75	111.4/ 50	111.4/ 50	75	124.9/ 50	124.9/ 50		
		25	110.3/ 50	110.3/ 50	25	122.4/ 50	122.4/ 50		
1990	BASELINE	0	100.2/ 50	100.2/ 50	0	114.3/ 50	114.3/ 50	0 0 63 37	2A/D
		100	100.2/ 50	100.2/ 50	100	114.3/ 50	114.3/ 50		2A/D
	1	40	106.8/ 50	106.8/ 50	40	118.1/ 50	118.1/ 50		2A/D
		60	100.2/ 50	100.2/ 50	60	114.3/ 50	114.3/ 50		2A/D
	2	40	110.3/ 50	110.3/ 50	40	122.2/ 50	122.2/ 50		
		60	103.4/ 50	103.4/ 50	60	118.1/ 50	118.1/ 50		
	3	75	111.4/ 50	111.4/ 50	75	124.7/ 50	124.7/ 50		
		25	110.3/ 50	110.3/ 50	25	122.2/ 50	122.2/ 50		
	4	75	117.8/ 50	117.8/ 50	75	132.9/ 50	132.9/ 50		
		25	116.5/ 50	116.5/ 50	25	129.9/ 50	129.9/ 50		
	5	75	111.4/ 50	111.4/ 50	75	124.8/ 50	124.8/ 50		
		25	110.3/ 50	110.3/ 50	25	122.2/ 50	122.2/ 50		
1995	BASELINE	0	100.0/ 50	100.0/ 50	0	113.9/ 50	113.9/ 50	0 0 59 41	2A/D
		100	100.0/ 50	100.0/ 50	100	113.9/ 50	113.9/ 50		2A/D
	1	40	106.8/ 50	106.8/ 50	40	117.9/ 50	117.9/ 50		2A/D
		60	100.0/ 50	100.0/ 50	60	113.9/ 50	113.9/ 50		2A/D
	2	40	110.2/ 50	110.2/ 50	40	121.9/ 50	121.9/ 50		
		60	103.1/ 50	103.1/ 50	60	117.7/ 50	117.7/ 50		
	3	75	111.4/ 50	111.4/ 50	75	124.6/ 50	124.6/ 50		
		25	110.2/ 50	110.2/ 50	25	121.9/ 50	121.9/ 50		
	4	75	117.8/ 50	117.8/ 50	75	132.8/ 50	132.8/ 50		
		25	116.5/ 50	116.5/ 50	25	129.6/ 50	129.6/ 50		
	5	75	111.4/ 50	111.4/ 50	75	124.7/ 50	124.7/ 50		
		25	110.2/ 50	110.2/ 50	25	121.9/ 50	121.9/ 50		
2000	BASELINE	0	99.7/ 50	99.7/ 50	0	113.6/ 50	113.6/ 50	0 0 53 47	2A/D
		100	99.7/ 50	99.7/ 50	100	113.6/ 50	113.6/ 50		2A/D
	1	40	106.8/ 50	106.8/ 50	40	117.6/ 50	117.6/ 50		2A/D
		60	99.7/ 50	99.7/ 50	60	113.6/ 50	113.6/ 50		2A/D
	2	40	110.3/ 50	110.3/ 50	40	121.7/ 50	121.7/ 50		
		60	102.9/ 50	102.9/ 50	60	117.3/ 50	117.3/ 50		
	3	75	111.5/ 50	111.5/ 50	75	124.4/ 50	124.4/ 50		
		25	110.3/ 50	110.3/ 50	25	121.7/ 50	121.7/ 50		
	4	75	117.9/ 50	117.9/ 50	75	132.5/ 50	132.5/ 50		
		25	116.5/ 50	116.5/ 50	25	129.3/ 50	129.3/ 50		
	5	75	111.5/ 50	111.5/ 50	75	124.5/ 50	124.5/ 50		
		25	110.3/ 50	110.3/ 50	25	121.7/ 50	121.7/ 50		

TABLE B-21

MINNEAPOLIS - ST. PAUL CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	%VAS USE	IFR CAPACITY 12% IFR (OPS/HR)/(% ARRIVALS)		%VAS USE	VFR CAPACITY 88% VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D	RUNWAY CONFIGURATION IFR LOW / IFR HIGH / VFR LOW / VFR HIGH
1975									
	BASELINE	0	57.8/ 50	57.8/ 50	0	59.3/ 50	116.7/ 50	0 10 76 14	1DLN
		100	57.8/ 50	57.8/ 50	100	59.3/ 50	116.7/ 50		1DLN
									1A/D
									2A/D
1980									
	BASELINE	0	56.7/ 50	56.7/ 50	0	58.6/ 50	117.2/ 50	0 5 76 19	1DLN
		100	56.7/ 50	56.7/ 50	100	58.6/ 50	117.2/ 50		1DLN
	1	40	61.1/ 50	61.1/ 50	40	59.9/ 50	119.7/ 50		1A/D
		60	56.7/ 50	56.7/ 50	60	58.6/ 50	117.2/ 50		2A/D
	2	40	63.6/ 50	63.6/ 50	40	62.0/ 50	123.9/ 50		
		60	56.0/ 50	58.0/ 50	60	60.6/ 50	121.2/ 50		
	3	75	73.9/ 50	73.9/ 50	75	62.8/ 50	125.7/ 50		
		25	63.6/ 50	63.6/ 50	25	62.0/ 50	123.9/ 50		
1985									
	BASELINE	0	55.9/ 50	55.9/ 50	0	58.1/ 50	116.1/ 50	0 0 77 23	1DLN
		100	55.9/ 50	55.9/ 50	100	58.1/ 50	116.1/ 50		1DLN
	1	40	61.1/ 50	61.1/ 50	40	59.5/ 50	119.1/ 50		1A/D
		60	55.9/ 50	55.9/ 50	60	58.1/ 50	116.1/ 50		2A/D
	2	40	63.6/ 50	63.6/ 50	40	61.6/ 50	123.2/ 50		
		60	57.2/ 50	57.2/ 50	60	60.0/ 50	120.1/ 50		
	3	75	74.1/ 50	74.1/ 50	75	62.6/ 50	125.2/ 50		
		25	63.6/ 50	63.6/ 50	25	61.6/ 50	123.2/ 50		
	4	75	82.7/ 50	82.7/ 50	75	66.7/ 50	133.4/ 50		
		25	67.5/ 50	67.5/ 50	25	65.5/ 50	131.1/ 50		
	5	75	76.5/ 50	76.5/ 50	75	62.7/ 50	125.3/ 50		
		25	63.6/ 50	63.6/ 50	25	61.6/ 50	123.2/ 50		
1990									
	BASELINE	0	55.1/ 50	55.1/ 50	0	57.7/ 50	115.5/ 50	0 0 73 27	1DLN
		100	55.1/ 50	55.1/ 50	100	57.7/ 50	115.5/ 50		1DLN
	1	40	60.8/ 50	60.8/ 50	40	59.4/ 50	118.8/ 50		1A/D
		60	55.1/ 50	55.1/ 50	60	57.7/ 50	115.5/ 50		2A/D
	2	40	63.4/ 50	63.4/ 50	40	61.4/ 50	122.9/ 50		
		60	56.3/ 50	56.3/ 50	60	59.7/ 50	119.4/ 50		
	3	75	73.9/ 50	73.9/ 50	75	62.5/ 50	125.1/ 50		
		25	63.4/ 50	63.4/ 50	25	61.4/ 50	122.9/ 50		
	4	75	82.4/ 50	82.4/ 50	75	66.6/ 50	133.3/ 50		
		25	67.2/ 50	67.2/ 50	25	65.3/ 50	130.7/ 50		
	5	75	76.3/ 50	76.3/ 50	75	62.6/ 50	125.2/ 50		
		25	63.4/ 50	63.4/ 50	25	61.4/ 50	122.9/ 50		
1995									
	BASELINE	0	54.4/ 50	54.4/ 50	0	57.5/ 50	114.9/ 50	0 0 69 31	1DLN
		100	54.4/ 50	54.4/ 50	100	57.5/ 50	114.9/ 50		1DLN
	1	40	60.6/ 50	60.6/ 50	40	59.2/ 50	118.5/ 50		1A/D
		60	54.4/ 50	54.4/ 50	60	57.5/ 50	114.9/ 50		2A/D
	2	40	63.2/ 50	63.2/ 50	40	61.3/ 50	122.6/ 50		
		60	55.5/ 50	55.5/ 50	60	59.4/ 50	118.8/ 50		
	3	75	73.7/ 50	73.7/ 50	75	62.5/ 50	124.9/ 50		
		25	63.2/ 50	63.2/ 50	25	61.3/ 50	122.6/ 50		
	4	75	82.2/ 50	82.2/ 50	75	66.6/ 50	133.1/ 50		
		25	66.9/ 50	66.9/ 50	25	65.2/ 50	130.3/ 50		
	5	75	76.1/ 50	76.1/ 50	75	62.5/ 50	125.0/ 50		
		25	63.2/ 50	63.2/ 50	25	61.3/ 50	122.6/ 50		
2000									
	BASELINE	0	53.8/ 50	53.8/ 50	0	57.2/ 50	114.5/ 50	0 0 65 35	1DLN
		100	53.8/ 50	53.8/ 50	100	57.2/ 50	114.5/ 50		1DLN
	1	40	60.5/ 50	60.5/ 50	40	59.1/ 50	118.2/ 50		1A/D
		60	53.8/ 50	53.8/ 50	60	57.2/ 50	114.5/ 50		2A/D
	2	40	63.0/ 50	63.0/ 50	40	61.1/ 50	122.3/ 50		
		60	54.9/ 50	54.9/ 50	60	59.1/ 50	118.3/ 50		
	3	75	73.6/ 50	73.6/ 50	75	62.4/ 50	124.8/ 50		
		25	63.0/ 50	63.0/ 50	25	61.1/ 50	122.3/ 50		
	4	75	82.1/ 50	82.1/ 50	75	66.5/ 50	133.0/ 50		
		25	66.7/ 50	66.7/ 50	25	65.0/ 50	130.0/ 50		
	5	75	76.0/ 50	76.0/ 50	75	62.5/ 50	124.9/ 50		
		25	63.0/ 50	63.0/ 50	25	61.1/ 50	122.3/ 50		

TABLE B-22

NEW ORLEANS CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	%VAS USE	IFR CAPACITY 112 IFR (OPS/HR)/(% ARRIVALS)		%VAS USE	VFR CAPACITY 898 VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D	RUNWAY CONFIGURATION	IFR LOW IFR HIGH VFR LOW VFR HIGH
1975	BASELINE	0	55.6/ 50	57.2/ 50	0	58.8/ 50	70.7/ 50	0 4 79 17	IFFX	
		100	55.6/ 50	57.2/ 50	100	58.8/ 50	70.7/ 50		IFNX	
									IFFX	
									IFNX	
1980	BASELINE	0	55.5/ 50	57.3/ 50	0	58.7/ 50	70.6/ 50	0 2 81 17	IFFX	
		100	55.5/ 50	57.3/ 50	100	58.7/ 50	70.6/ 50		IFNX	
	1	40	58.4/ 50	61.5/ 50	40	59.9/ 50	72.8/ 50		IFFX	
		60	55.5/ 50	57.3/ 50	60	58.7/ 50	70.6/ 50		IFNX	
	2	40	61.1/ 50	64.0/ 50	40	62.0/ 50	75.9/ 50			
		60	56.8/ 50	58.7/ 50	60	60.7/ 50	73.6/ 50			
	3	75	62.4/ 50	69.8/ 50	75	62.3/ 50	77.1/ 50			
		25	61.1/ 50	64.0/ 50	25	62.0/ 50	75.9/ 50			
1985	BASELINE	0	55.3/ 50	57.1/ 50	0	58.5/ 50	70.3/ 50	0 0 82 18	IFFX	
		100	55.3/ 50	57.1/ 50	100	58.5/ 50	70.3/ 50		IFNX	
	1	40	58.9/ 50	61.5/ 50	40	59.8/ 50	72.6/ 50		IFFX	
		60	55.3/ 50	57.1/ 50	60	58.5/ 50	70.3/ 50		IFNX	
	2	40	61.0/ 50	64.0/ 50	40	61.9/ 50	75.7/ 50			
		60	56.6/ 50	58.5/ 50	60	60.5/ 50	73.2/ 50			
	3	75	62.7/ 50	69.7/ 50	75	62.7/ 50	77.0/ 50			
		25	61.0/ 50	64.0/ 50	25	61.9/ 50	75.7/ 50			
	4	75	66.8/ 50	74.8/ 50	75	66.8/ 50	85.0/ 50			
		25	64.5/ 50	68.0/ 50	25	65.6/ 50	81.7/ 50			
	5	75	62.7/ 50	69.7/ 50	75	62.7/ 50	78.6/ 50			
		25	61.0/ 50	64.0/ 50	25	61.9/ 50	75.7/ 50			
1990	BASELINE	0	54.5/ 50	56.1/ 50	0	98.1/ 50	65.1/ 50	0 0 78 22	IFFX	
		100	54.5/ 50	56.1/ 50	100	58.1/ 50	65.1/ 50		IFNX	
	1	40	58.5/ 50	61.2/ 50	40	59.6/ 50	71.8/ 50		IFFX	
		60	54.5/ 50	56.1/ 50	60	58.1/ 50	65.1/ 50		IFNX	
	2	40	60.7/ 50	63.7/ 50	40	61.7/ 50	74.9/ 50			
		60	55.7/ 50	57.4/ 50	60	60.1/ 50	71.9/ 50			
	3	75	62.1/ 50	69.6/ 50	75	62.6/ 50	76.4/ 50			
		25	60.7/ 50	63.7/ 50	25	61.7/ 50	74.9/ 50			
	4	75	66.7/ 50	74.6/ 50	75	66.7/ 50	84.6/ 50			
		25	64.5/ 50	67.6/ 50	25	65.6/ 50	80.7/ 50			
	5	75	62.7/ 50	69.6/ 50	75	62.7/ 50	78.2/ 50			
		25	60.7/ 50	63.7/ 50	25	61.7/ 50	74.9/ 50			
1995	BASELINE	0	53.6/ 50	55.1/ 50	0	57.7/ 50	67.7/ 50	0 0 73 27	IFFX	
		100	53.6/ 50	55.1/ 50	100	57.7/ 50	67.7/ 50		IFNX	
	1	40	58.1/ 50	60.8/ 50	40	59.4/ 50	71.0/ 50		IFFX	
		60	53.6/ 50	55.1/ 50	60	57.7/ 50	67.7/ 50		IFNX	
	2	40	60.3/ 50	63.4/ 50	40	61.4/ 50	74.3/ 50			
		60	54.8/ 50	56.3/ 50	60	59.7/ 50	70.4/ 50			
	3	75	62.6/ 50	69.4/ 50	75	62.5/ 50	75.7/ 50			
		25	60.3/ 50	63.4/ 50	25	61.4/ 50	74.0/ 50			
	4	75	66.6/ 50	74.4/ 50	75	66.6/ 50	84.2/ 50			
		25	64.1/ 50	67.2/ 50	25	65.3/ 50	79.7/ 50			
	5	75	62.6/ 50	69.4/ 50	75	62.6/ 50	77.3/ 50			
		25	60.3/ 50	63.4/ 50	25	61.4/ 50	74.0/ 50			
2000	BASELINE	0	52.9/ 50	54.2/ 50	0	57.4/ 50	66.5/ 50	0 0 68 32	IFFX	
		100	52.9/ 50	54.2/ 50	100	57.4/ 50	66.5/ 50		IFNX	
	1	40	57.5/ 50	60.6/ 50	40	59.2/ 50	71.3/ 50		IFFX	
		60	52.9/ 50	54.2/ 50	60	57.4/ 50	66.5/ 50		IFNX	
	2	40	60.0/ 50	63.1/ 50	40	61.2/ 50	73.3/ 50			
		60	54.0/ 50	55.4/ 50	60	59.3/ 50	69.1/ 50			
	3	75	62.5/ 50	69.3/ 50	75	62.4/ 50	75.2/ 50			
		25	60.0/ 50	63.1/ 50	25	61.2/ 50	73.3/ 50			
	4	75	66.5/ 50	74.3/ 50	75	66.5/ 50	83.8/ 50			
		25	63.7/ 50	66.9/ 50	25	65.1/ 50	78.9/ 50			
	5	75	62.5/ 50	69.3/ 50	75	62.5/ 50	77.5/ 50			
		25	60.0/ 50	63.1/ 50	25	61.2/ 50	73.3/ 50			

TABLE B-23

O'HARE CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	AVAS USE	IFR CAPACITY 15% IFR (OPS/HR)/(% ARRIVALS)		AVAS USE	VFR CAPACITY 85% VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D*	RUNWAY CONFIGURATION (IFR LOW / IFR HIGH / VFR LOW / VFR HIGH)
1975	BASELINE	0	102.0/ 50	134.5/ 42	0	136.9/ 50	136.9/ 50	0 10 67 23*	2A/D
		100	102.0/ 50	134.5/ 42	100	136.9/ 50	136.9/ 50		1DLN1ARR1DEP
									INFX1NNX
									INFX1NNX
1980	BASELINE	0	101.5/ 50	133.1/ 43	0	135.0/ 50	135.0/ 50	0 4 70 26*	2A/D
		100	101.5/ 50	133.1/ 43	100	135.0/ 50	135.0/ 50		1DLN1ARR1DEP
	1	40	107.0/ 50	146.1/ 42	40	141.6/ 50	141.6/ 50		INFX1NNX
		60	101.5/ 50	133.1/ 43	60	135.0/ 50	135.0/ 50		INFX1NNX
	2	40	110.4/ 50	149.7/ 42	40	147.6/ 50	147.6/ 50		
		60	104.7/ 50	135.3/ 43	60	140.4/ 50	140.4/ 50		
	3	75	111.4/ 50	170.4/ 43	75	152.2/ 50	152.2/ 50		
		25	110.4/ 50	149.7/ 42	25	147.6/ 50	147.6/ 50		
1985	BASELINE	0	101.1/ 50	131.7/ 43	0	133.3/ 50	133.3/ 50	0 0 71 29*	2A/D
		100	101.1/ 50	131.7/ 43	100	133.3/ 50	133.3/ 50		1DLN1ARR1DEP
	1	40	106.9/ 50	145.9/ 42	40	140.9/ 50	140.9/ 50		INFX1NNX
		60	101.1/ 50	131.7/ 43	60	133.3/ 50	133.3/ 50		INFX1NNX
	2	40	110.3/ 50	149.5/ 42	40	146.7/ 50	146.7/ 50		
		60	104.3/ 50	133.8/ 43	60	138.5/ 50	138.5/ 50		
	3	75	111.3/ 50	170.7/ 43	75	151.8/ 50	151.8/ 50		
		25	110.3/ 50	149.5/ 42	25	146.7/ 50	146.7/ 50		
	4	75	117.7/ 50	187.3/ 46	75	169.0/ 50	169.0/ 50		
		25	116.6/ 50	155.4/ 43	25	157.9/ 50	157.9/ 50		
	5	75	111.3/ 50	177.5/ 45	75	156.3/ 50	156.3/ 50		
		25	110.3/ 50	149.5/ 42	25	146.7/ 50	146.7/ 50		
1990	BASELINE	0	100.4/ 50	128.8/ 43	0	130.1/ 50	130.1/ 50	0 0 65 35*	2A/D
		100	100.4/ 50	128.8/ 43	100	130.1/ 50	130.1/ 50		1DLN1ARR1DEP
	1	40	106.8/ 50	145.0/ 42	40	138.8/ 50	138.8/ 50		INFX1NNX
		60	100.4/ 50	128.8/ 43	60	130.1/ 50	130.1/ 50		INFX1NNX
	2	40	110.3/ 50	148.7/ 43	40	144.6/ 50	144.6/ 50		
		60	103.6/ 50	130.9/ 43	60	135.0/ 50	135.0/ 50		
	3	75	111.4/ 50	170.4/ 43	75	150.9/ 50	150.9/ 50		
		25	110.3/ 50	148.7/ 43	25	144.6/ 50	144.6/ 50		
	4	75	117.8/ 50	186.6/ 46	75	168.4/ 50	168.4/ 50		
		25	116.5/ 50	154.4/ 44	25	155.5/ 50	155.5/ 50		
	5	75	111.4/ 50	177.0/ 45	75	155.7/ 50	155.7/ 50		
		25	110.3/ 50	148.7/ 43	25	144.6/ 50	144.6/ 50		
1995	BASELINE	0	100.0/ 50	126.7/ 43	0	127.5/ 50	127.5/ 50	0 0 60 40*	2A/D
		100	100.0/ 50	126.7/ 43	100	127.5/ 50	127.5/ 50		1DLN1ARR1DEP
	1	40	106.8/ 50	144.6/ 42	40	137.5/ 50	137.5/ 50		INFX1NNX
		60	100.0/ 50	126.7/ 43	60	127.5/ 50	127.5/ 50		INFX1NNX
	2	40	110.2/ 50	148.2/ 43	40	143.1/ 50	143.1/ 50		
		60	103.2/ 50	128.9/ 44	60	132.3/ 50	132.3/ 50		
	3	75	111.4/ 50	170.2/ 43	75	150.3/ 50	150.3/ 50		
		25	110.2/ 50	148.2/ 43	25	143.1/ 50	143.1/ 50		
	4	75	117.8/ 50	186.3/ 46	75	168.0/ 50	168.0/ 50		
		25	116.5/ 50	153.9/ 44	25	153.7/ 50	153.7/ 50		
	5	75	111.4/ 50	176.7/ 45	75	155.3/ 50	155.3/ 50		
		25	110.2/ 50	148.2/ 43	25	143.1/ 50	143.1/ 50		
2000	BASELINE	0	99.8/ 50	125.0/ 43	0	125.2/ 50	125.2/ 50	0 0 55 45*	2A/D
		100	99.8/ 50	125.0/ 43	100	125.2/ 50	125.2/ 50		1DLN1ARR1DEP
	1	40	106.8/ 50	144.4/ 42	40	136.3/ 50	136.3/ 50		INFX1NNX
		60	99.8/ 50	125.0/ 43	60	125.2/ 50	125.2/ 50		INFX1NNX
	2	40	110.2/ 50	148.1/ 43	40	141.7/ 50	141.7/ 50		
		60	102.9/ 50	127.1/ 44	60	129.8/ 50	129.8/ 50		
	3	75	111.5/ 50	170.1/ 43	75	149.9/ 50	149.9/ 50		
		25	110.2/ 50	148.1/ 43	25	141.7/ 50	141.7/ 50		
	4	75	117.8/ 50	186.1/ 46	75	167.7/ 50	167.7/ 50		
		25	116.5/ 50	153.7/ 44	25	152.3/ 50	152.3/ 50		
	5	75	111.5/ 50	176.6/ 45	75	155.1/ 50	155.1/ 50		
		25	110.2/ 50	148.1/ 43	25	141.7/ 50	141.7/ 50		

TABLE B-24

PHILADELPHIA CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	%VAS USE	IFR CAPACITY 15% IFR (OPS/HR)/(% ARRIVALS)		%VAS USE	VFR CAPACITY 85% VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D	RUNWAY CONFIGURATION (IFR LOW, IFR HIGH, VFR LOW, VFR HIGH)
1975	BASELINE	0	57.3/ 50	57.3/ 50	0	73.4/ 50	73.4/ 50	0 23 63 14	1DLN
		100	57.3/ 50	57.3/ 50	100	73.4/ 50	73.4/ 50		1DLN
									1DLN
									1DLN
1980	BASELINE	0	57.8/ 50	57.8/ 50	0	73.6/ 50	73.6/ 50	0 11 75 14	1DLN
		100	57.8/ 50	57.8/ 50	100	73.6/ 50	73.6/ 50		1DLN
	1	40	61.3/ 50	61.3/ 50	40	75.4/ 50	75.4/ 50		1DLN
		60	57.8/ 50	57.8/ 50	60	73.6/ 50	73.6/ 50		1DLN
	2	40	63.7/ 50	63.7/ 50	40	78.7/ 50	78.7/ 50		
		60	59.3/ 50	59.3/ 50	60	76.8/ 50	76.8/ 50		
	3	75	73.7/ 50	73.7/ 50	75	80.0/ 50	80.0/ 50		
		25	63.7/ 50	63.7/ 50	25	78.7/ 50	78.7/ 50		
1985	BASELINE	0	57.4/ 50	57.4/ 50	0	72.7/ 50	72.7/ 50	0 0 83 17	1DLN
		100	57.4/ 50	57.4/ 50	100	72.7/ 50	72.7/ 50		1DLN
	1	40	61.6/ 50	61.6/ 50	40	75.0/ 50	75.0/ 50		1DLN
		60	57.4/ 50	57.4/ 50	60	72.7/ 50	72.7/ 50		1DLN
	2	40	64.1/ 50	64.1/ 50	40	78.4/ 50	78.4/ 50		
		60	58.8/ 50	58.8/ 50	60	75.8/ 50	75.8/ 50		
	3	75	74.4/ 50	74.4/ 50	75	79.8/ 50	79.8/ 50		
		25	64.1/ 50	64.1/ 50	25	78.4/ 50	78.4/ 50		
	4	75	83.2/ 50	83.2/ 50	75	88.5/ 50	86.5/ 50		
		25	68.2/ 50	68.2/ 50	25	84.8/ 50	84.8/ 50		
	5	75	77.0/ 50	77.0/ 50	75	81.5/ 50	81.5/ 50		
		25	64.1/ 50	64.1/ 50	25	78.4/ 50	78.4/ 50		
1990	BASELINE	0	56.9/ 50	56.9/ 50	0	72.0/ 50	72.0/ 50	0 0 81 19	1DLN
		100	56.9/ 50	56.9/ 50	100	72.0/ 50	72.0/ 50		1DLN
	1	40	61.4/ 50	61.4/ 50	40	74.6/ 50	74.6/ 50		1DLN
		60	56.9/ 50	56.9/ 50	60	72.0/ 50	72.0/ 50		1DLN
	2	40	63.9/ 50	63.9/ 50	40	77.8/ 50	77.8/ 50		
		60	58.2/ 50	58.2/ 50	60	75.0/ 50	75.0/ 50		
	3	75	74.3/ 50	74.3/ 50	75	79.5/ 50	79.5/ 50		
		25	63.9/ 50	63.9/ 50	25	77.8/ 50	77.8/ 50		
	4	75	83.0/ 50	83.0/ 50	75	88.2/ 50	88.2/ 50		
		25	67.9/ 50	67.9/ 50	25	84.2/ 50	84.2/ 50		
	5	75	76.8/ 50	76.8/ 50	75	81.3/ 50	81.3/ 50		
		25	63.9/ 50	63.9/ 50	25	77.8/ 50	77.8/ 50		
1995	BASELINE	0	56.1/ 50	56.1/ 50	0	71.0/ 50	71.0/ 50	0 0 78 22	1DLN
		100	56.1/ 50	56.1/ 50	100	71.0/ 50	71.0/ 50		1DLN
	1	40	61.2/ 50	61.2/ 50	40	73.9/ 50	73.9/ 50		1DLN
		60	56.1/ 50	56.1/ 50	60	71.0/ 50	71.0/ 50		1DLN
	2	40	63.7/ 50	63.7/ 50	40	77.1/ 50	77.1/ 50		
		60	57.4/ 50	57.4/ 50	60	73.9/ 50	73.9/ 50		
	3	75	74.1/ 50	74.1/ 50	75	79.0/ 50	79.0/ 50		
		25	63.7/ 50	63.7/ 50	25	77.1/ 50	77.1/ 50		
	4	75	82.8/ 50	82.8/ 50	75	87.9/ 50	87.9/ 50		
		25	67.6/ 50	67.6/ 50	25	83.4/ 50	83.4/ 50		
	5	75	76.6/ 50	76.6/ 50	75	80.9/ 50	80.9/ 50		
		25	63.7/ 50	63.7/ 50	25	77.1/ 50	77.1/ 50		
2000	BASELINE	0	55.3/ 50	55.3/ 50	0	69.7/ 50	69.7/ 50	0 0 74 26	1DLN
		100	55.3/ 50	55.3/ 50	100	69.7/ 50	69.7/ 50		1DLN
	1	40	60.9/ 50	60.9/ 50	40	73.1/ 50	73.1/ 50		1DLN
		60	55.3/ 50	55.3/ 50	60	69.7/ 50	69.7/ 50		1DLN
	2	40	63.4/ 50	63.4/ 50	40	76.2/ 50	76.2/ 50		
		60	56.5/ 50	56.5/ 50	60	72.6/ 50	72.6/ 50		
	3	75	73.9/ 50	73.9/ 50	75	78.4/ 50	78.4/ 50		
		25	63.4/ 50	63.4/ 50	25	76.2/ 50	76.2/ 50		
	4	75	82.5/ 50	82.5/ 50	75	87.4/ 50	87.4/ 50		
		25	67.3/ 50	67.3/ 50	25	82.3/ 50	82.3/ 50		
	5	75	76.3/ 50	76.3/ 50	75	80.6/ 50	80.6/ 50		
		25	63.4/ 50	63.4/ 50	25	76.2/ 50	76.2/ 50		

TABLE B-25

PITTSBURGH CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	%VAS USE	IFR CAPACITY 17% IFR (OPS/HR)/(% ARRIVALS)		%VAS USE	VFR CAPACITY 83% VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D	RUNWAY CONFIGURATION IFR LOW IFR HIGH VFR LOW VFR HIGH
1975	BASELINE	0	87.9/ 35	87.9/ 35	0	101.4/ 50	101.4/ 50	0 22 73 5	1ARR1DEP
		100	87.9/ 35	87.9/ 35	100	101.4/ 50	101.4/ 50		1ARR1DEP
									1FFX1A/D
									1FFX1A/D
1980	BASELINE	0	87.5/ 35	89.0/ 50	0	100.8/ 50	100.8/ 50	0 10 84 6	1ARR1DEP
		100	87.5/ 35	89.0/ 50	100	100.8/ 50	100.8/ 50		1VFX1A/D
	1	40	89.5/ 35	89.8/ 50	40	101.3/ 50	101.3/ 50		1FFX1A/D
		60	87.5/ 35	89.0/ 50	60	100.8/ 50	100.8/ 50		1FFX1A/D
	2	40	90.7/ 36	92.3/ 50	40	104.4/ 50	104.4/ 50		
		60	88.7/ 36	91.4/ 50	60	103.9/ 50	103.9/ 50		
	3	75	97.2/ 38	92.4/ 50	75	104.7/ 50	104.7/ 50		
		25	90.7/ 36	92.3/ 50	25	104.4/ 50	104.4/ 50		
1985	BASELINE	0	84.9/ 36	87.6/ 50	0	99.8/ 50	99.8/ 50	0 0 89 11	1ARR1DEP
		100	84.9/ 36	87.6/ 50	100	99.8/ 50	99.8/ 50		1VFX1A/D
	1	40	86.5/ 35	89.0/ 50	40	100.6/ 50	100.6/ 50		1FFX1A/D
		60	84.9/ 36	87.6/ 50	60	99.8/ 50	99.8/ 50		1FFX1A/D
	2	40	89.6/ 36	91.5/ 50	40	103.7/ 50	103.7/ 50		
		60	86.0/ 37	90.0/ 50	60	102.8/ 50	102.8/ 50		
	3	75	97.5/ 38	91.7/ 50	75	104.2/ 50	104.2/ 50		
		25	89.6/ 36	91.5/ 50	25	103.7/ 50	103.7/ 50		
	4	75	106.9/ 44	96.2/ 50	75	110.1/ 50	110.1/ 50		
		25	91.8/ 38	95.9/ 50	25	109.4/ 50	109.4/ 50		
	5	75	103.0/ 42	91.7/ 50	75	104.2/ 50	104.2/ 50		
		25	89.6/ 36	91.5/ 50	25	103.7/ 50	103.7/ 50		
1990	BASELINE	0	82.8/ 36	87.1/ 50	0	99.3/ 50	99.3/ 50	0 0 85 15	1ARR1DEP
		100	82.8/ 36	87.1/ 50	100	99.3/ 50	99.3/ 50		1VFX1A/D
	1	40	87.5/ 36	89.0/ 50	40	100.4/ 50	100.4/ 50		1FFX1A/D
		60	82.8/ 36	87.1/ 50	60	99.3/ 50	99.3/ 50		1FFX1A/D
	2	40	88.7/ 36	91.4/ 50	40	103.4/ 50	103.4/ 50		
		60	83.9/ 37	89.5/ 50	60	102.3/ 50	102.3/ 50		
	3	75	97.3/ 38	91.7/ 50	75	104.1/ 50	104.1/ 50		
		25	88.7/ 36	91.4/ 50	25	103.4/ 50	103.4/ 50		
	4	75	106.4/ 44	96.2/ 50	75	110.0/ 50	110.0/ 50		
		25	90.8/ 38	95.9/ 50	25	109.1/ 50	109.1/ 50		
	5	75	102.5/ 41	91.7/ 50	75	104.2/ 50	104.2/ 50		
		25	88.7/ 36	91.4/ 50	25	103.4/ 50	103.4/ 50		
1995	BASELINE	0	80.9/ 37	86.7/ 50	0	98.9/ 50	98.9/ 50	0 0 81 19	1ARR1DEP
		100	80.9/ 37	86.7/ 50	100	98.9/ 50	98.9/ 50		1NFX1A/D
	1	40	86.7/ 36	88.9/ 50	40	100.2/ 50	100.2/ 50		1FFX1A/D
		60	80.9/ 37	86.7/ 50	60	98.9/ 50	98.9/ 50		1FFX1A/D
	2	40	87.8/ 37	91.4/ 50	40	103.2/ 50	103.2/ 50		
		60	82.0/ 38	89.1/ 50	60	101.8/ 50	101.8/ 50		
	3	75	97.2/ 38	91.7/ 50	75	104.1/ 50	104.1/ 50		
		25	87.8/ 37	91.4/ 50	25	103.2/ 50	103.2/ 50		
	4	75	105.9/ 43	96.2/ 50	75	109.9/ 50	109.9/ 50		
		25	89.9/ 38	95.8/ 50	25	108.9/ 50	108.9/ 50		
	5	75	102.1/ 41	91.7/ 50	75	104.1/ 50	104.1/ 50		
		25	87.8/ 37	91.4/ 50	25	103.2/ 50	103.2/ 50		
2000	BASELINE	0	79.2/ 37	86.4/ 50	0	98.5/ 50	98.5/ 50	0 0 77 23	1ARR1DEP
		100	79.2/ 37	86.4/ 50	100	98.5/ 50	98.5/ 50		1VFX1A/D
	1	40	86.0/ 36	88.9/ 50	40	100.0/ 50	100.0/ 50		1FFX1A/D
		60	79.2/ 37	86.4/ 50	60	98.5/ 50	98.5/ 50		1FFX1A/D
	2	40	87.1/ 37	91.3/ 50	40	103.0/ 50	103.0/ 50		
		60	80.2/ 38	88.7/ 50	60	101.4/ 50	101.4/ 50		
	3	75	97.1/ 38	91.8/ 50	75	104.0/ 50	104.0/ 50		
		25	87.1/ 37	91.3/ 50	25	103.0/ 50	103.0/ 50		
	4	75	105.5/ 43	96.3/ 50	75	109.8/ 50	109.8/ 50		
		25	89.2/ 38	95.8/ 50	25	108.7/ 50	108.7/ 50		
	5	75	101.8/ 41	91.8/ 50	75	104.0/ 50	104.0/ 50		
		25	87.1/ 37	91.3/ 50	25	103.0/ 50	103.0/ 50		

AD-A037 079 MITRE CORP MCLEAN VA F/G 1/5

ESTIMATION OF UG3RD CAPACITY IMPACTS.(U)

JAN 77 A P SMITH DOT-FA70WA-2448

UNCLASSIFIED MTR-7138 FAA-AVP-77-9 NL

2 OF 2

AD A037079

END

DATE FILMED 4-77

TABLE B-28

SKY HARBOR CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	MVAS USE	IFR CAPACITY OC IFR (OPS/HR)/(% ARRIVALS)		MVAS USE	VFR CAPACITY 100% VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D	RUNWAY CONFIGURATION IFR LOW / IFR HIGH / VFR LOW / VFR HIGH
1975	BASELINE	0	58.0/ 50	58.0/ 50	0	118.4/ 50	118.4/ 50	0 6 80 14	10LV
		100	58.0/ 50	58.0/ 50	100	118.4/ 50	118.4/ 50		10LV
									24/D
									24/D
1980	BASELINE	0	59.6/ 50	59.6/ 50	0	118.9/ 50	118.9/ 50	0 0 90 10	10LV
		100	59.6/ 50	59.6/ 50	100	118.9/ 50	118.9/ 50		10LV
	1	40	62.3/ 50	62.3/ 50	40	120.4/ 50	120.4/ 50		24/D
		60	59.6/ 50	59.6/ 50	60	118.9/ 50	118.9/ 50		24/D
	2	40	64.8/ 50	64.8/ 50	40	124.7/ 50	124.7/ 50		
		60	61.2/ 50	61.2/ 50	60	123.0/ 50	123.0/ 50		
	3	75	74.9/ 50	74.9/ 50	75	125.7/ 50	125.7/ 50		
		25	64.8/ 50	64.8/ 50	25	124.7/ 50	124.7/ 50		
1985	BASELINE	0	58.3/ 50	58.3/ 50	0	117.9/ 50	117.9/ 50	0 0 86 14	10LV
		100	58.3/ 50	58.3/ 50	100	117.9/ 50	117.9/ 50		10LV
	1	40	61.9/ 50	61.9/ 50	40	120.0/ 50	120.0/ 50		24/D
		60	58.3/ 50	58.3/ 50	60	117.9/ 50	117.9/ 50		24/D
	2	40	64.4/ 50	64.4/ 50	40	124.2/ 50	124.2/ 50		
		60	59.8/ 50	59.8/ 50	60	122.0/ 50	122.0/ 50		
	3	75	74.6/ 50	74.6/ 50	75	125.5/ 50	125.5/ 50		
		25	64.4/ 50	64.4/ 50	25	124.2/ 50	124.2/ 50		
	4	75	83.5/ 50	83.5/ 50	75	133.8/ 50	133.8/ 50		
		25	68.5/ 50	68.5/ 50	25	132.1/ 50	132.1/ 50		
	5	75	77.2/ 50	77.2/ 50	75	125.6/ 50	125.6/ 50		
		25	64.4/ 50	64.4/ 50	25	124.2/ 50	124.2/ 50		
1990	BASELINE	0	57.1/ 50	57.1/ 50	0	117.0/ 50	117.0/ 50	0 0 82 18	10LV
		100	57.1/ 50	57.1/ 50	100	117.0/ 50	117.0/ 50		10LV
	1	40	61.5/ 50	61.5/ 50	40	119.6/ 50	119.6/ 50		24/D
		60	57.1/ 50	57.1/ 50	60	117.0/ 50	117.0/ 50		24/D
	2	40	64.0/ 50	64.0/ 50	40	123.7/ 50	123.7/ 50		
		60	58.5/ 50	58.5/ 50	60	121.0/ 50	121.0/ 50		
	3	75	74.4/ 50	74.4/ 50	75	125.4/ 50	125.4/ 50		
		25	64.0/ 50	64.0/ 50	25	123.7/ 50	123.7/ 50		
	4	75	83.1/ 50	83.1/ 50	75	133.6/ 50	133.6/ 50		
		25	68.0/ 50	68.0/ 50	25	131.6/ 50	131.6/ 50		
	5	75	76.9/ 50	76.9/ 50	75	125.5/ 50	125.5/ 50		
		25	64.0/ 50	64.0/ 50	25	123.7/ 50	123.7/ 50		
1995	BASELINE	0	56.1/ 50	56.1/ 50	0	116.3/ 50	116.3/ 50	0 0 78 22	10LV
		100	56.1/ 50	56.1/ 50	100	116.3/ 50	116.3/ 50		10LV
	1	40	61.2/ 50	61.2/ 50	40	119.2/ 50	119.2/ 50		24/D
		60	56.1/ 50	56.1/ 50	60	116.3/ 50	116.3/ 50		24/D
	2	40	63.7/ 50	63.7/ 50	40	123.3/ 50	123.3/ 50		
		60	57.4/ 50	57.4/ 50	60	120.2/ 50	120.2/ 50		
	3	75	74.1/ 50	74.1/ 50	75	125.2/ 50	125.2/ 50		
		25	63.7/ 50	63.7/ 50	25	123.3/ 50	123.3/ 50		
	4	75	82.8/ 50	82.8/ 50	75	133.5/ 50	133.5/ 50		
		25	67.6/ 50	67.6/ 50	25	131.2/ 50	131.2/ 50		
	5	75	76.6/ 50	76.6/ 50	75	125.3/ 50	125.3/ 50		
		25	63.7/ 50	63.7/ 50	25	123.3/ 50	123.3/ 50		
2000	BASELINE	0	55.3/ 50	55.3/ 50	0	115.6/ 50	115.6/ 50	0 0 74 26	10LV
		100	55.3/ 50	55.3/ 50	100	115.6/ 50	115.6/ 50		10LN
	1	40	60.9/ 50	60.9/ 50	40	118.8/ 50	118.8/ 50		24/D
		60	55.3/ 50	55.3/ 50	60	115.6/ 50	115.6/ 50		24/D
	2	40	63.4/ 50	63.4/ 50	40	123.0/ 50	123.0/ 50		
		60	56.5/ 50	56.5/ 50	60	119.5/ 50	119.5/ 50		
	3	75	73.9/ 50	73.9/ 50	75	125.1/ 50	125.1/ 50		
		25	63.4/ 50	63.4/ 50	25	123.0/ 50	123.0/ 50		
	4	75	82.5/ 50	82.5/ 50	75	133.3/ 50	133.3/ 50		
		25	67.3/ 50	67.3/ 50	25	130.8/ 50	130.8/ 50		
	5	75	76.3/ 50	76.3/ 50	75	125.2/ 50	125.2/ 50		
		25	63.4/ 50	63.4/ 50	25	123.0/ 50	123.0/ 50		

TABLE B-27

SEATTLE CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	%AVAS USE	IFR CAPACITY 16% IFR (OPS/HR)/(% ARRIVALS)		%AVAS USE	VFR CAPACITY 84% VFR (OPS/HR)/(% ARRIVALS)		MIX A	B	C	D	RUNWAY CONFIGURATION	IFR LOW IFR HIGH VFR LOW VFR HIGH
1975	BASELINE	0	53.8/ 50	53.8/ 50	0	67.5/ 50	67.5/ 50	0	3	63	34	10LN	
		100	53.8/ 50	53.8/ 50	100	67.5/ 50	67.5/ 50					10LN	
												10LN	
												10LN	
1980	BASELINE	0	53.6/ 50	53.6/ 50	0	67.0/ 50	67.0/ 50	0	0	64	36	10LN	
		100	53.6/ 50	53.6/ 50	100	67.0/ 50	67.0/ 50					10LN	
	1	40	60.5/ 50	60.5/ 50	40	71.5/ 50	71.5/ 50					10LN	
		60	53.6/ 50	53.6/ 50	60	67.0/ 50	67.0/ 50					10LN	
	2	40	63.0/ 50	63.0/ 50	40	74.5/ 50	74.5/ 50						
		60	54.3/ 50	54.8/ 50	60	69.7/ 50	69.7/ 50						
	3	75	73.5/ 50	73.5/ 50	75	77.4/ 50	77.4/ 50						
		25	63.0/ 50	63.0/ 50	25	74.5/ 50	74.5/ 50						
1985	BASELINE	0	53.6/ 50	53.6/ 50	0	67.0/ 50	67.0/ 50	0	0	64	36	10LN	
		100	53.6/ 50	53.6/ 50	100	67.0/ 50	67.0/ 50					10LN	
	1	40	60.5/ 50	60.5/ 50	40	71.5/ 50	71.5/ 50					10LN	
		60	53.6/ 50	53.6/ 50	60	67.0/ 50	67.0/ 50					10LN	
	2	40	63.0/ 50	63.0/ 50	40	74.5/ 50	74.5/ 50						
		60	54.3/ 50	54.8/ 50	60	69.7/ 50	69.7/ 50						
	3	75	73.5/ 50	73.5/ 50	75	77.4/ 50	77.4/ 50						
		25	63.0/ 50	63.0/ 50	25	74.5/ 50	74.5/ 50						
	4	75	82.1/ 50	82.1/ 50	75	86.7/ 50	86.7/ 50						
		25	66.7/ 50	66.7/ 50	25	80.3/ 50	80.3/ 50						
	5	75	76.0/ 50	76.0/ 50	75	79.9/ 50	79.9/ 50						
		25	63.0/ 50	63.0/ 50	25	74.5/ 50	74.5/ 50						
1990	BASELINE	0	53.1/ 50	53.1/ 50	0	66.1/ 50	66.1/ 50	0	0	60	40	10LN	
		100	53.1/ 50	53.1/ 50	100	66.1/ 50	66.1/ 50					10LN	
	1	40	60.4/ 50	60.4/ 50	40	71.0/ 50	71.0/ 50					10LN	
		60	53.1/ 50	53.1/ 50	60	66.1/ 50	66.1/ 50					10LN	
	2	40	62.9/ 50	62.9/ 50	40	74.0/ 50	74.0/ 50						
		60	54.3/ 50	54.3/ 50	60	68.7/ 50	68.7/ 50						
	3	75	73.4/ 50	73.4/ 50	75	77.1/ 50	77.1/ 50						
		25	62.9/ 50	62.9/ 50	25	74.0/ 50	74.0/ 50						
	4	75	82.0/ 50	82.0/ 50	75	86.5/ 50	86.5/ 50						
		25	66.6/ 50	66.6/ 50	25	79.7/ 50	79.7/ 50						
	5	75	75.9/ 50	75.9/ 50	75	79.8/ 50	79.8/ 50						
		25	62.9/ 50	62.9/ 50	25	74.0/ 50	74.0/ 50						
1995	BASELINE	0	52.7/ 50	52.7/ 50	0	65.3/ 50	65.3/ 50	0	0	56	44	10LN	
		100	52.7/ 50	52.7/ 50	100	65.3/ 50	65.3/ 50					10LN	
	1	40	60.4/ 50	60.4/ 50	40	70.6/ 50	70.6/ 50					10LN	
		60	52.7/ 50	52.7/ 50	60	65.3/ 50	65.3/ 50					10LN	
	2	40	62.9/ 50	62.9/ 50	40	73.5/ 50	73.5/ 50						
		60	53.9/ 50	53.9/ 50	60	67.8/ 50	67.8/ 50						
	3	75	73.4/ 50	73.4/ 50	75	77.0/ 50	77.0/ 50						
		25	62.9/ 50	62.9/ 50	25	73.5/ 50	73.5/ 50						
	4	75	82.0/ 50	82.0/ 50	75	86.3/ 50	86.3/ 50						
		25	66.5/ 50	66.5/ 50	25	79.2/ 50	79.2/ 50						
	5	75	75.9/ 50	75.9/ 50	75	79.7/ 50	79.7/ 50						
		25	62.9/ 50	62.9/ 50	25	73.5/ 50	73.5/ 50						
2000	BASELINE	0	52.2/ 50	52.2/ 50	0	64.2/ 50	64.2/ 50	0	0	50	50	10LN	
		100	52.2/ 50	52.2/ 50	100	64.2/ 50	64.2/ 50					10LN	
	1	40	60.5/ 50	60.5/ 50	40	70.1/ 50	70.1/ 50					10LN	
		60	52.2/ 50	52.2/ 50	60	64.2/ 50	64.2/ 50					10LN	
	2	40	63.0/ 50	63.0/ 50	40	73.0/ 50	73.0/ 50						
		60	53.5/ 50	53.5/ 50	60	66.6/ 50	66.6/ 50						
	3	75	73.3/ 50	73.3/ 50	75	76.9/ 50	76.9/ 50						
		25	63.0/ 50	63.0/ 50	25	73.0/ 50	73.0/ 50						
	4	75	82.1/ 50	82.1/ 50	75	86.3/ 50	86.3/ 50						
		25	66.5/ 50	66.5/ 50	25	78.6/ 50	78.6/ 50						
	5	75	76.0/ 50	76.0/ 50	75	79.6/ 50	79.6/ 50						
		25	63.0/ 50	63.0/ 50	25	73.0/ 50	73.0/ 50						

TABLE B-28

SAN FRANCISCO CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	%VAS %USE	IFR CAPACITY 10% IFR (OPS/HR)/(% ARRIVALS)		%VAS %USE	VFR CAPACITY 90% VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D	RUNWAY CONFIGURATION (IFR LOW / IFR HIGH / VFR LOW / VFR HIGH)
1975	BASELINE	0	52.4/ 50	54.3/ 50	0	76.7/ 50	76.7/ 50	0 1 68 31	IFFX
		100	52.4/ 50	54.3/ 50	100	76.7/ 50	76.7/ 50		IDLN
									INNX
									INNX
1980	BASELINE	0	52.2/ 50	54.1/ 50	0	76.3/ 50	76.3/ 50	0 0 67 33	IFFX
		100	52.2/ 50	54.1/ 50	100	76.3/ 50	76.3/ 50		IDLN
	1	40	56.9/ 50	60.6/ 50	40	76.3/ 50	76.3/ 50		INNX
		60	52.2/ 50	54.1/ 50	60	76.3/ 50	76.3/ 50		INNX
	2	40	59.0/ 50	63.1/ 50	40	79.8/ 50	79.8/ 50		
		60	53.4/ 50	55.2/ 50	60	79.8/ 50	79.8/ 50		
	3	75	61.2/ 50	73.6/ 50	75	82.9/ 50	82.9/ 50		
		25	59.0/ 50	63.1/ 50	25	79.8/ 50	79.8/ 50		
1985	BASELINE	0	51.9/ 50	53.6/ 50	0	75.7/ 50	75.7/ 50	0 0 64 36	IFFX
		100	51.9/ 50	53.6/ 50	100	75.7/ 50	75.7/ 50		IDLN
	1	40	56.8/ 50	60.5/ 50	40	75.7/ 50	75.7/ 50		INNX
		60	51.9/ 50	53.6/ 50	60	75.7/ 50	75.7/ 50		INNX
	2	40	58.9/ 50	63.0/ 50	40	79.1/ 50	79.1/ 50		
		60	53.1/ 50	54.8/ 50	60	79.1/ 50	79.1/ 50		
	3	75	61.3/ 50	73.5/ 50	75	82.4/ 50	82.4/ 50		
		25	58.5/ 50	63.0/ 50	25	79.1/ 50	79.1/ 50		
	4	75	65.1/ 50	84.4/ 50	75	93.8/ 50	93.8/ 50		
		25	62.5/ 50	66.7/ 50	25	85.7/ 50	85.7/ 50		
	5	75	61.3/ 50	78.0/ 50	75	86.0/ 50	86.0/ 50		
		25	58.9/ 50	63.0/ 50	25	79.1/ 50	79.1/ 50		
1990	BASELINE	0	51.6/ 50	53.1/ 50	0	74.9/ 50	74.9/ 50	0 0 60 40	IFFX
		100	51.6/ 50	53.1/ 50	100	74.9/ 50	74.9/ 50		IDLN
	1	40	56.8/ 50	60.4/ 50	40	74.9/ 50	74.9/ 50		INNX
		60	51.6/ 50	53.1/ 50	60	74.9/ 50	74.9/ 50		INNX
	2	40	58.9/ 50	62.5/ 50	40	78.3/ 50	78.3/ 50		
		60	52.8/ 50	54.3/ 50	60	78.3/ 50	78.3/ 50		
	3	75	61.3/ 50	73.4/ 50	75	81.9/ 50	81.9/ 50		
		25	58.9/ 50	62.9/ 50	25	78.3/ 50	78.3/ 50		
	4	75	65.2/ 50	84.1/ 50	75	93.5/ 50	93.5/ 50		
		25	62.4/ 50	66.6/ 50	25	84.7/ 50	84.7/ 50		
	5	75	61.3/ 50	77.8/ 50	75	85.7/ 50	85.7/ 50		
		25	58.9/ 50	62.9/ 50	25	78.3/ 50	78.3/ 50		
1995	BASELINE	0	51.2/ 50	52.6/ 50	0	74.1/ 50	74.1/ 50	0 0 55 45	IFFX
		100	51.2/ 50	52.6/ 50	100	74.1/ 50	74.1/ 50		IDLN
	1	40	56.7/ 50	60.4/ 50	40	74.1/ 50	74.1/ 50		INNX
		60	51.2/ 50	52.6/ 50	60	74.1/ 50	74.1/ 50		INNX
	2	40	58.8/ 50	62.9/ 50	40	77.4/ 50	77.4/ 50		
		60	52.5/ 50	53.8/ 50	60	77.4/ 50	77.4/ 50		
	3	75	61.4/ 50	73.4/ 50	75	81.4/ 50	81.4/ 50		
		25	58.8/ 50	62.9/ 50	25	77.4/ 50	77.4/ 50		
	4	75	65.3/ 50	83.9/ 50	75	93.2/ 50	93.2/ 50		
		25	62.4/ 50	66.5/ 50	25	83.7/ 50	83.7/ 50		
	5	75	61.4/ 50	77.6/ 50	75	85.5/ 50	85.5/ 50		
		25	58.8/ 50	62.9/ 50	25	77.4/ 50	77.4/ 50		
2000	BASELINE	0	51.0/ 50	52.1/ 50	0	73.3/ 50	73.3/ 50	0 0 49 51	IFFX
		100	51.0/ 50	52.1/ 50	100	73.3/ 50	73.3/ 50		IDLN
	1	40	56.8/ 50	60.5/ 50	40	73.3/ 50	73.3/ 50		INNX
		60	51.0/ 50	52.1/ 50	60	73.3/ 50	73.3/ 50		INNX
	2	40	58.9/ 50	63.1/ 50	40	76.5/ 50	76.5/ 50		
		60	52.3/ 50	53.4/ 50	60	76.5/ 50	76.5/ 50		
	3	75	61.4/ 50	73.3/ 50	75	81.0/ 50	81.0/ 50		
		25	58.9/ 50	63.1/ 50	25	76.5/ 50	76.5/ 50		
	4	75	65.3/ 50	83.9/ 50	75	93.1/ 50	93.1/ 50		
		25	62.4/ 50	66.6/ 50	25	82.6/ 50	82.6/ 50		
	5	75	61.4/ 50	77.6/ 50	75	85.4/ 50	85.4/ 50		
		25	58.9/ 50	63.1/ 50	25	76.5/ 50	76.5/ 50		

TABLE B-29

ST. LOUIS CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	%WVAS USE	IFR CAPACITY 12% IFR (OPS/HR)/(% ARRIVALS)		%WVAS USE	VFR CAPACITY 88% VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D	RUNWAY CONFIGURATION IFR LOW IFR HIGH VFR LOW VFR HIGH
1975	BASELINE	0	59.4/ 50	59.4/ 50	0	75.6/ 50	75.6/ 50	0 10 81 9	1VFX
		100	59.4/ 50	59.4/ 50	100	75.6/ 50	75.6/ 50		1VFX
									1VFX
									1VFX
1980	BASELINE	0	59.0/ 50	59.0/ 50	0	74.9/ 50	74.9/ 50	0 4 85 11	1DLN
		100	59.0/ 50	59.0/ 50	100	74.9/ 50	74.9/ 50		1DLN
	1	40	62.0/ 50	62.0/ 50	40	76.5/ 50	76.5/ 50		1DLN
		60	59.0/ 50	59.0/ 50	60	74.9/ 50	74.9/ 50		1DLN
	2	40	64.5/ 50	64.5/ 50	40	79.9/ 50	79.9/ 50		
		60	60.7/ 50	60.7/ 50	60	78.3/ 50	78.3/ 50		
	3	75	74.5/ 50	74.5/ 50	75	80.9/ 50	80.9/ 50		
		25	64.5/ 50	64.5/ 50	25	79.9/ 50	79.9/ 50		
1985	BASELINE	0	58.0/ 50	58.0/ 50	0	73.5/ 50	73.5/ 50	0 0 85 15	1DLN
		100	58.0/ 50	58.0/ 50	100	73.5/ 50	73.5/ 50		1DLN
	1	40	61.8/ 50	61.8/ 50	40	75.5/ 50	75.5/ 50		1DLN
		60	58.0/ 50	58.0/ 50	60	73.5/ 50	73.5/ 50		1DLN
	2	40	64.3/ 50	64.3/ 50	40	78.9/ 50	78.9/ 50		
		60	59.4/ 50	59.4/ 50	60	76.6/ 50	76.6/ 50		
	3	75	74.6/ 50	74.6/ 50	75	80.2/ 50	80.2/ 50		
		25	64.3/ 50	64.3/ 50	25	78.9/ 50	78.9/ 50		
	4	75	83.4/ 50	83.4/ 50	75	86.8/ 50	86.8/ 50		
		25	68.4/ 50	68.4/ 50	25	85.4/ 50	85.4/ 50		
	5	75	77.1/ 50	77.1/ 50	75	81.7/ 50	81.7/ 50		
		25	64.3/ 50	64.3/ 50	25	78.9/ 50	78.9/ 50		
1990	BASELINE	0	56.9/ 50	56.9/ 50	0	72.0/ 50	72.0/ 50	0 0 81 19	1DLN
		100	56.9/ 50	56.9/ 50	100	72.0/ 50	72.0/ 50		1DLN
	1	40	61.4/ 50	61.4/ 50	40	74.6/ 50	74.6/ 50		1DLN
		60	56.9/ 50	56.9/ 50	60	72.0/ 50	72.0/ 50		1DLN
	2	40	63.9/ 50	63.9/ 50	40	77.8/ 50	77.8/ 50		
		60	58.2/ 50	58.2/ 50	60	75.0/ 50	75.0/ 50		
	3	75	74.3/ 50	74.3/ 50	75	79.5/ 50	79.5/ 50		
		25	63.9/ 50	63.9/ 50	25	77.8/ 50	77.8/ 50		
	4	75	83.0/ 50	83.0/ 50	75	88.2/ 50	88.2/ 50		
		25	67.9/ 50	67.9/ 50	25	84.2/ 50	84.2/ 50		
	5	75	76.3/ 50	76.8/ 50	75	81.3/ 50	81.3/ 50		
		25	63.9/ 50	63.9/ 50	25	77.8/ 50	77.8/ 50		
1995	BASELINE	0	55.7/ 50	55.7/ 50	0	70.3/ 50	70.3/ 50	0 0 76 24	1DLN
		100	55.7/ 50	55.7/ 50	100	70.3/ 50	70.3/ 50		1DLN
	1	40	61.0/ 50	61.0/ 50	40	73.5/ 50	73.5/ 50		1DLN
		60	55.7/ 50	55.7/ 50	60	70.3/ 50	70.3/ 50		1DLN
	2	40	63.5/ 50	63.5/ 50	40	76.7/ 50	76.7/ 50		
		60	56.9/ 50	56.9/ 50	60	73.2/ 50	73.2/ 50		
	3	75	74.0/ 50	74.0/ 50	75	78.7/ 50	78.7/ 50		
		25	63.5/ 50	63.5/ 50	25	76.7/ 50	76.7/ 50		
	4	75	82.6/ 50	82.6/ 50	75	87.6/ 50	87.6/ 50		
		25	67.4/ 50	67.4/ 50	25	82.8/ 50	82.8/ 50		
	5	75	76.4/ 50	76.4/ 50	75	80.8/ 50	80.8/ 50		
		25	63.5/ 50	63.5/ 50	25	76.7/ 50	76.7/ 50		
2000	BASELINE	0	54.5/ 50	54.5/ 50	0	68.6/ 50	68.6/ 50	0 0 70 30	1DLN
		100	54.5/ 50	54.5/ 50	100	68.6/ 50	68.6/ 50		1DLN
	1	40	60.7/ 50	60.7/ 50	40	72.4/ 50	72.4/ 50		1DLN
		60	54.5/ 50	54.5/ 50	60	68.6/ 50	68.6/ 50		1DLN
	2	40	63.2/ 50	63.2/ 50	40	75.5/ 50	75.5/ 50		
		60	55.7/ 50	55.7/ 50	60	71.3/ 50	71.3/ 50		
	3	75	73.7/ 50	73.7/ 50	75	77.9/ 50	77.9/ 50		
		25	63.2/ 50	63.2/ 50	25	75.5/ 50	75.5/ 50		
	4	75	82.3/ 50	82.3/ 50	75	87.1/ 50	87.1/ 50		
		25	67.0/ 50	67.0/ 50	25	81.4/ 50	81.4/ 50		
	5	75	76.1/ 50	76.1/ 50	75	80.3/ 50	80.3/ 50		
		25	63.2/ 50	63.2/ 50	25	75.5/ 50	75.5/ 50		

TABLE B-30

TAMPA CAPACITY ESTIMATES
UG3RD COST/BENEFITS STUDY

YEAR	SYSTEM PACKAGE	%WVAS USE	IFR CAPACITY 7% IFR (OPS/HR)/(% ARRIVALS)		%WVAS USE	VFR CAPACITY 93% VFR (OPS/HR)/(% ARRIVALS)		MIX A B C D	RUNWAY CONFIGURATION (IFR LOW / IFR HIGH / VFR LOW / VFR HIGH)
1975	BASELINE	0	82.3/ 36	82.3/ 36	0	117.6/ 50	117.6/ 50	0 2 82 16	1ARR1DEP
		100	82.3/ 36	82.3/ 36	100	117.6/ 50	117.6/ 50		1ARR1DEP
									2A/D
									2A/D
1980	BASELINE	0	80.5/ 37	80.5/ 37	0	116.7/ 50	116.7/ 50	0 0 80 20	1ARR1DEP
		100	80.5/ 37	80.5/ 37	100	116.7/ 50	116.7/ 50		1ARR1DEP
	1	40	86.5/ 36	86.5/ 36	40	119.4/ 50	119.4/ 50		2A/D
		60	80.5/ 37	80.5/ 37	60	116.7/ 50	116.7/ 50		2A/D
	2	40	67.6/ 37	87.6/ 37	40	123.5/ 50	123.5/ 50		
		60	81.5/ 38	81.5/ 38	60	120.6/ 50	120.6/ 50		
	3	75	97.1/ 38	97.1/ 38	75	125.3/ 50	125.3/ 50		
		25	87.6/ 37	87.6/ 37	25	123.5/ 50	123.5/ 50		
1985	BASELINE	0	75.8/ 37	78.8/ 37	0	115.9/ 50	115.9/ 50	0 0 76 24	1ARR1DEP
		100	78.8/ 37	78.8/ 37	100	115.9/ 50	115.9/ 50		1ARR1DEP
	1	40	85.8/ 36	85.8/ 36	40	119.0/ 50	119.0/ 50		2A/D
		60	78.8/ 37	78.8/ 37	60	115.9/ 50	115.9/ 50		2A/D
	2	40	86.9/ 37	86.9/ 37	40	123.1/ 50	123.1/ 50		
		60	79.3/ 38	79.8/ 38	60	119.9/ 50	119.9/ 50		
	3	75	97.0/ 38	97.0/ 38	75	125.2/ 50	125.2/ 50		
		25	86.9/ 37	86.9/ 37	25	123.1/ 50	123.1/ 50		
	4	75	105.4/ 43	105.4/ 43	75	133.4/ 50	133.4/ 50		
		25	89.0/ 38	89.0/ 38	25	131.0/ 50	131.0/ 50		
	5	75	101.7/ 41	101.7/ 41	75	125.3/ 50	125.3/ 50		
		25	86.9/ 37	86.9/ 37	25	123.1/ 50	123.1/ 50		
1990	BASELINE	0	77.3/ 37	77.3/ 37	0	115.3/ 50	115.3/ 50	0 0 72 28	1ARR1DEP
		100	77.3/ 37	77.3/ 37	100	115.3/ 50	115.3/ 50		1ARR1DEP
	1	40	89.2/ 36	85.2/ 36	40	118.7/ 50	118.7/ 50		2A/D
		60	77.3/ 37	77.3/ 37	60	115.3/ 50	115.3/ 50		2A/D
	2	40	86.4/ 37	86.4/ 37	40	122.8/ 50	122.8/ 50		
		60	78.3/ 38	78.3/ 38	60	119.2/ 50	119.2/ 50		
	3	75	96.9/ 38	96.9/ 38	75	125.0/ 50	125.0/ 50		
		25	86.4/ 37	86.4/ 37	25	122.8/ 50	122.8/ 50		
	4	75	105.1/ 43	105.1/ 43	75	133.2/ 50	133.2/ 50		
		25	88.5/ 38	88.5/ 38	25	130.6/ 50	130.6/ 50		
	5	75	101.4/ 41	101.4/ 41	75	125.1/ 50	125.1/ 50		
		25	86.4/ 37	86.4/ 37	25	122.8/ 50	122.8/ 50		
1995	BASELINE	0	76.3/ 38	76.3/ 38	0	114.9/ 50	114.9/ 50	0 0 69 31	1ARR1DEP
		100	76.3/ 38	76.3/ 38	100	114.9/ 50	114.9/ 50		1ARR1DEP
	1	40	84.9/ 36	84.9/ 36	40	118.5/ 50	118.5/ 50		2A/D
		60	76.3/ 38	76.3/ 38	60	114.9/ 50	114.9/ 50		2A/D
	2	40	86.0/ 37	86.0/ 37	40	122.6/ 50	122.6/ 50		
		60	77.3/ 38	77.3/ 38	60	118.8/ 50	118.8/ 50		
	3	75	96.9/ 38	96.9/ 38	75	124.9/ 50	124.9/ 50		
		25	86.0/ 37	86.0/ 37	25	122.6/ 50	122.6/ 50		
	4	75	104.8/ 43	104.8/ 43	75	133.1/ 50	133.1/ 50		
		25	88.1/ 38	88.1/ 38	25	130.3/ 50	130.3/ 50		
	5	75	101.2/ 41	101.2/ 41	75	125.0/ 50	125.0/ 50		
		25	86.0/ 37	86.0/ 37	25	122.6/ 50	122.6/ 50		
2000	BASELINE	0	75.0/ 38	75.0/ 38	0	114.5/ 50	114.3/ 50	0 0 65 35	1ARR1DEP
		100	75.0/ 38	75.0/ 38	100	114.5/ 50	114.5/ 50		1ARR1DEP
	1	40	84.5/ 36	84.5/ 36	40	118.2/ 50	118.2/ 50		2A/D
		60	75.0/ 38	75.0/ 38	60	114.5/ 50	114.5/ 50		2A/D
	2	40	85.6/ 37	85.6/ 37	40	122.3/ 50	122.3/ 50		
		60	76.0/ 39	76.0/ 39	60	118.3/ 50	118.3/ 50		
	3	75	96.8/ 38	96.8/ 38	75	124.8/ 50	124.8/ 50		
		25	85.6/ 37	85.6/ 37	25	122.3/ 50	122.3/ 50		
	4	75	104.6/ 43	104.6/ 43	75	133.0/ 50	133.0/ 50		
		25	87.7/ 39	87.7/ 39	25	130.0/ 50	130.0/ 50		
	5	75	101.0/ 41	101.0/ 41	75	124.9/ 50	124.9/ 50		
		25	85.6/ 37	85.6/ 37	25	122.3/ 50	122.3/ 50		

TABLE B-31
CAPACITY COMPARISONS

	RUNWAY CONFIGURATION	IFR/VFR	UG3RD	FAA STUDY (REF. 9)	ASTC (REF. 11)	EPS (REF. 12)
ATL	A 9L/8 D 9R/8	I V	108 130	105 125	90 124	103 103
BOS	A 33L D 33L	I	52	---	---	49
	A 4R D 4L	I V	57 92	--- ---	--- ---	66 ---
	A 4R/L D 4R	V	117	---	---	115
ORD	A 27R, 32L D 32R, 27L	V	147	140	158	137-153
	A 14L/R D 9L/R	I	102	108	---	---
	A 27L/R D 32L/R	I	135	133	---	137
CLE	A 5 or 23 D 5 or 23	I V	52 73	--- ---	--- ---	49 60
	A 5 D 36	I V	--- ---	--- ---	50 92	--- ---
DCA	A 36 D 36	I V	54 62	--- ---	40 81	52 52
	A 36,33 D 36,3	V	78	---	---	80

CAPACITY COMPARISONS (CONTINUED)

	RUNWAY CONFIGURATION	IFR/VFR	UG3RD	FAA STUDY (REF. 9)	ASTC (REF. 11)	EPS (REF. 12)
DFW	A 17R/L	I	104	---	---	104
	D 17R/L	V	118	---	---	113
EWR	A 4R	I	51	50	40	50
	D 4R	V	59	60	81	60
	A 4L	I	57	54	---	58
	D 4R	V	80	80	---	79
JFK	A 4L/R D 4R	I	58	64	58	52
	A 4L D 4R	V	81	82	86	81
LAX	A 24R/25L	I	107	104	116	132
	D 24L/25R	V	167	158	162	132
SFO	A 28L	I	52	50	58	68
	D 1L	V	77	80	93	76
	A 28R D 28L	I	54	---	---	67
STL	A 12R	I	59	---	---	---
	D 12L	V	76	---	---	---
	A 12R	I	---	---	---	52
	D 12R	V	---	---	---	78

CAPACITY COMPARISONS (CONCLUDED)

	RUNWAY CONFIGURATION	IFR/VFR	UG3RD	FAA STUDY (REF. 9)	ASTC (REF. 11)	EPS (REF. 12)
DTW	A 3L D 3R	I	79	---	58	---
	A 3L/R D 3L/R	V	117	---	108	---
SEA	A 16R D 16L	I V	54 67	--- ---	58 81	--- ---
LGA	A 22 D 13	I V	61 78	60 80	65 93	68 68
	A 22 D 31	I V	58 78	56 74	--- ---	64 68
MIA	A 27R/L D 27R/L	I V	101 116	100 120	80 108	100 111
PHL	A 27L D 27R	I V	57 73	52 66	58 108	57 69
PIT	A 10L D 10R	I	88*	---	---	68

* 35% Arrivals

APPENDIX C

CAPACITY INCREASES DUE TO ADDITIONAL CLOSE-SPACED PARALLEL RUNWAYS

It has been shown (Reference 14) that with certain combinations of surveillance accuracies and surveillance update periods, the minimum spacing required for simultaneous parallel IFR approaches can be reduced from 4300 feet to 3000 feet. If one considers the 30 airports studies here, one finds that eight of them have parallel runway pairs spaced in the 3000 to 4300 foot range. These airports are listed in Table C-1. There are only four of these airports which will accrue major runway IFR capacity gains with the reduction of parallel runway spacing minima, namely Dallas-Love, Memphis, Minneapolis-St. Paul, and J. F. Kennedy.

In order to justify simultaneous IFR approaches to parallel runways spaced less than 3400 feet apart, surveillance update intervals must be of the order of 1 second or the azimuthal surveillance accuracy must be better than 1 milliradian or both. Depending on the ability of a data link to reduce delays in the communications between the controllers and pilots, trade-offs between a data link and update rate/accuracy can be made. However, to achieve a reduction to below 3400 feet, a parallel approach monitoring system is required. This system would be compatible with UG3RD Generation E&D products such as DABS and would have the required surveillance accuracy and update rate. The approach monitor, however, could be developed independently of the UG3RD E&D products. Depending on when such monitoring equipment was implemented and to what degree the UG3RD Generation E&D products were implemented, the increase in IFR arrival capacity at the four airports could range from 46% to 92%. Table C-2 shows the weighted average IFR arrival capacities with and without the approach monitor at the four airports.

TABLE C-1

AIRPORTS WITH PARALLEL RUNWAYS

SPACED 2500-4300 APART

Airport	Runway Pair	Spacing	Remarks
Cleveland (CLE)	10-28	3812	28L is only 3800 feet long and is currently a taxiway.
Dallas-Love (DAL)	13-31	3000	
Detroit (DTW)	3-21	3800	Additional independent parallel runway being constructed with spacing >4300 ft.
Indianapolis (IND)	4-22	2800	22L is only 3700 feet long
J.F. Kennedy (JFK)	4-22	3000	Possible if missed approach procedures can be designed.
Memphis (MEM)	17-35	3406	
Mpls-St.Paul (MSP)	11-29	3200	
Sky Harbor (PHX)	8-26	3400	Less than 1% IFR conditions

TABLE C-2
WEIGHTED AVERAGE IFR ARRIVAL CAPACITY (ARRIVALS/HR)

AIRPORT		WITHOUT APPROACH MONITOR			WITH APPROACH MONITOR (% INCREASE)		
	YEAR	BASELINE	CONF. 1	CONF. 2, 3, 4, 5	BASELINE	CONF. 1	CONF. 2, 3, 4, 5
DALLAS-LOVE	1975	28.9	28.9	28.9	52.8 (83%)	52.8 (83%)	52.8 (83%)
	1980	28.7	28.7	28.7	52.6 (83%)	52.6 (83%)	52.6 (83%)
	1985	28.3	30.1	35.8	52.3 (85%)	53.8 (79%)	55.5 (55%)
	1990	27.8	29.8	39.4	52.0 (87%)	53.6 (80%0	58.7 (49%)
	1995	27.4	29.5	39.3	51.9 (89%)	53.4 (81%)	58.7 (49%)
	2000	26.9	29.1	39.1	51.6 (92%)	53.2 (83%)	58.7 (50%)
MEMPHIS	1975	30.8	30.8	30.8	53.7 (74%)	53.7 (74%)	53.7 (74%)
	1980	30.8	30.8	30.8	53.5 (74%)	53.5 (74%)	53.5 (74%)
	1985	30.3	31.8	36.3	53.2 (76%)	54.8 (72%)	55.5 (53%)
	1990	30.0	31.5	40.2	53.0 (77%)	54.6 (73%)	58.7 (46%)
	1995	29.6	31.2	40.1	52.9 (79%)	54.4 (74%)	58.7 (46%)
	2000	29.3	30.9	39.9	52.7 (80%)	54.3 (76%)	58.7 (47%)
MPS-STPAUL	1975	28.9	28.9	28.9	52.8 (83%)	52.8 (83%)	52.8 (83%)
	1980	28.3	28.3	28.3	52.4 (85%)	52.4 (85%)	52.4 (85%)
	1985	27.9	29.9	35.7	52.1 (87%)	53.6 (79%)	55.5 (55%)
	1990	27.5	29.6	39.3	51.9 (89%)	53.4 (80%)	58.7 (49%)
	1995	27.2	29.3	39.2	51.7 (90%)	53.3 (82%)	58.7 (50%)
	2000	26.9	29.1	39.1	51.6 (92%)	53.1 (82%)	58.7 (50%)
J.F.K., NEW YORK	1975	32.0	32.0	32.0	57.8 (81%)	57.8 (81%)	57.8 (81%)
	1980	32.1	32.1	32.1	57.8 (80%)	57.8 (80%)	57.8 (80%)
	1985	31.8	34.4	36.6	57.8 (82%)	56.3 (64%)	63.3 (73%)
	1990	31.4	34.2	40.3	57.9 (84%)	56.2 (64%)	70.5 (75%)
	1995	31.3	34.5	40.3	58.0 (85%)	56.2 (63%)	70.5 (75%)
	2000	31.0	34.0	40.4	58.2 (88%)	56.4 (66%)	70.9 (75%)

APPENDIX D

REFERENCES

1. Harris, R. M., "Models for Runway Capacity Analysis." The MITRE Corporation, MTR-4102, Rev. 2, Washington, D. C., December 1972.

2. Haines, A. L. and Sinha, A. N., "Concepts for Estimating Capacity of Basic Runway Configurations," The MITRE Corporation, MTR-7115, Washington, D. C., January 1976.

3. Federal Aviation Administration, Airfield Capacity and Delay Handbook 74-124, May 1975, Draft Final Report.

4. Haines, A. L., "Concepts for Determination of Longitudinal Separation Standards on Final Approach," The MITRE Corporation, MTR-7047, Washington, D. C., October 1975.

5. Sinha, A. N., and Haines, A. L., "Longitudinal Separation Standards for Final Approach for Future ATC Environments." The MITRE Corporation, MTR-6979, Washington, D.C., September 1975.

6. Federal Aviation Administration, Terminal Air Traffic Control Handbook 7110.8D, Washington, D. C., January 1, 1975.

7. Harris, R. M., "The Dual-Lane Runway Concept," The MITRE Corporation, M72-156, Washington, D. C., August 1972.

8. Rodgers, John M, "Interim Report UG3RD System Level Cost Benefit Study," Policy Analysis Division of Office of Aviation Policy, FAA, Washington, D. C., July 1975.

9. Federal Aviation Administration, "FAA Report on Airport Capacity - Volume II - Eight Airport Survey." FAA-EM-74-5, II, January 1974.

10. Federal Aviation Administration, "Ceiling Visibility Climatological Study and System Enhancement Factors," SRDS, DOT-FA 75WA1-547.

11. Baran, G., Bales, R. A., and Koetsch, J. F., "Airport Surface Traffic Control Systems Deployment Analysis," The MITRE Corporation, MTR-6482, Washington, D. C., September 1973.

12. "Runway Acceptance Rate Standards," Letter from AAT-10 to AVP-200, dated 8 July 1975.

13. "Current Status of ILS Program," Airways Facilities Service, Establishment Program Division Document dated 31 March 1975.

14. Haines, A. L., "Requirements for 3500 Foot Spacings for Simultaneous Parallel IFR Approaches," The MITRE Corporation, MTR-6841, January 1975.

15. Rodgers, John and Fromme, William, "Policy Analysis of the UG3RD ATC System," Policy Analysis Division of Office of Aviation Policy, FAA, Washington, D.C., forthcoming 1976.

16. "Estimation of UG3RD Delay Reduction," Battelle Columbus Laboratories, forthcoming 1976.

17. "UG3RD Baseline and Implementation Scenarios," Office of Aviation Policy, FAA, Washington, D. C., forthcoming 1976.